

THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 83.

NEW YORK, SATURDAY, NOVEMBER 14, 1903.

No. 20.

ORIGINAL ARTICLES.

CHRONIC VILLOUS ARTHRITIS, WITH SPECIAL REFERENCE TO ITS ETIOLOGY AND PATHOLOGY.*

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In a paper published in the *Boston Medical and Surgical Journal* under date of March 19, 1903, the authors undertook to review the literature of lipoma arborescens, and to supplement this with a report of seven cases which had come to operation. In that series the lipomata were discrete, usually single growths, and would be better described as fatty tumors than as the arborescent lipoma. The pathological investigation of these growths, however, shows that they were undoubtedly degenerated villi and not true tumor formations. They had, however, lost all gross resemblance to the original fringes from which they were developed. As discrete tumors, they gave rise to rather different symptoms than the ordinary synovial fringe.

In the literature there are several authors who believe that the fatty growths found in the joints are true tumors, which push their way in from the outside rather than develop from within. The article just referred to, we think, shows that these growths are the result of an hypertrophy of synovial villi. There are, clinically, a great many cases where the villi are hypertrophied, and where the isolated, single lipomata are not present. The purpose of this article is to report a study of 33 cases of hypertrophied villi,† caused by various conditions, and to show, if possible, the varying etiology of this joint disease, and to put on record the pathological findings observed in these cases.

REPORT OF CASES.

Case No. 1.—1898. H., male, forty years of age; a motorman.‡ Diagnosis, osteo-arthritis. The patient felt pain, particularly in walking, with swelling in both knees, and limitation in extremes of both flexion and extension. There was no locking, and the function was limited. General tonic treatment. Both knee-joints, the feet and the fingers were involved. Motion of knee two-thirds of normal arc. The examination of knees also showed general diffuse swelling, but no definite fringe, and the joints were tender. A lateral incision (internal) was made in one knee, showing

the capsule to be thick and very vascular on the synovial side, and containing fibrinous clots. The fringes were numerous, attached to the synovial membrane in its entire extent, dark reddish purple in color and soft. Some hemorrhage occurred. The capsule was closed with silk, not drained, and a plaster dressing applied. Patient was lost sight of after his discharge from the hospital. He had a great deal of trouble in the other knee and the other joints. The knee which had been operated upon was less painful when he left the hospital than it had been and was less swollen.

Pathology.—Microscopically the cross section of a fringe shows a thin enclosing membrane of endothelium. Within is connective tissue densely infiltrated by small round cells, which form not only a broad peripheral band, but also penetrate deeply into the tissue, usually in round aggregations. The fibrous tissue is abundantly supplied with vessels which show thickened walls and are filled with blood. At a little distance from the cortex the connective tissue becomes granular in appearance and small areas of fat cells appear. There is marked hemorrhagic extravasation throughout the tissue.

Case No. 2.—May 12, 1899. M. F., female, twenty-nine years of age; a machine stitcher. Diagnosis, joint syphilis. The patient's family and past history are negative and no exciting cause is known for her present illness, the onset of which occurred three and one-half years ago, when the patient noticed swelling around patella of the right knee, and two years ago pain in the upper part of the right thigh and some in the knee. Since then the swelling has increased. On examination the right knee was found to be involved, with localized swelling on the outer side of the joint and some synovitis. The amount of motion was nearly normal. A fringe could be readily felt on the outer side of the knee and the joint was tender. On May 12 an excision of the lipomatous fringe on the outer aspect of the right knee was done. Incision in outer aspect of joint revealed a cyst, which was drained, and one hypertrophied fatty fringe in the joint, attached to the synovia, the size of a small hen's egg, and supplied with blood through a pedicle, was removed.

It was grayish in color and of a firm consistency. No ligatures or irritation, the capsule was closed with silk, without drainage, and a soft dressing applied. The general postoperative condition was good, the stitches were taken out in eight days, and the joint immediately manipulated. In two weeks the motion was fairly good.

Pathology.—The pathologist reported that the fringe removed was tuberculous. On the strength of his report the knee was excised with a good

*Presented at the Seventeenth Annual Meeting of the Orthopedic Association, Washington, D. C., May 11-14, 1903.

†Seven have been reported as above stated. The other 26 have not before been reported.

‡Diagnosis at beginning of history signifies etiological factor in case.

result. A little later superficial skin ulcerations appeared on the left side of the neck. These were very indolent. Six months later a hard annular swelling, accompanied by pain, appeared on the left humerus in the upper third of the shaft. Under the administration of iodide of potash and mercury both this swelling and the ulcerations in the neck entirely disappeared, and she has since remained well, with the exception of a short interval when she omitted the iodide. The return to the drug was marked by immediate improvement.

Case No. 3.—June 9, 1899. J. A. R., male, eighteen years; at school. Diagnosis, acute arthritis with succeeding rheumatoid condition. Five months ago patient had an attack of acute rheumatism involving all the joints and the eyes. A typical case of acute articular rheumatism with pain, swelling and limitation, but no locking; attended by a loss of function for sixteen weeks. The condition gradually improved. On examination the patient was found to be poorly developed and nourished. The knees and ankle-joints were involved. Motion was free in the knees. Fringes could be felt, but there was no tenderness. A lateral incision in the left knee showed the capsule to be thickened, containing some fibrin but no excess of fluid. Numerous fringes were attached to all parts of the synovial membrane, arborescent and very large, vascular, purple in color, and soft, except for the tips of a few which were fibrous. There was some hemorrhage, the wound was irrigated, and the capsule closed with silk. No drainage was used and a plaster dressing was applied. In one week the stitches were taken out and after the first dressing daily manipulation was given. Function was restored two weeks after operation. Patient has since gone to pieces generally. There has been a recurrence of the eye symptoms, and swelling in the knee has been intermittent or in a nine-day cycle, one knee being swollen when the other is not. After the operation only one cycle was interrupted.

Pathology.—Many papillary tags, soft tissue. Hardened in alcohol.

Histology.—Branching papillary tags. Base composed of fibrous fat tissue in which are numerous large blood vessels. Fat tissue edematous. In places bands of fibrous tissue, some old and dense, others showing many fibroblasts, *i.e.*, proliferating, connective tissue. Outside and extending from this case a stalk of fibrous tissue covered with very vascular, almost angiomatic tissue on the surface of which are leucocytes and fibrin. The stalk itself is dense fibrous tissue, and projecting from the side of the stalk are small circular or irregular vascular areas like apples on a stem. These areas consist of very numerous blood vessels practically angiomatic with great infiltration of leucocytes and some fibrin on the surface. Parts of the areas show fibrinoid degeneration, with, at times, marked necrosis. Specimen hardened in alcohol and not satisfactory for examination. Many arteries show

a well marked proliferation of connective tissue in the intima. Fibrin stain shows that most of the material of the papilla is dense connective tissue with some fibrinoid degeneration in places.

Case No. 4.—March 12, 1900. J. D., female, twenty years of age. Diagnosis, rheumatoid arthritis. Her family and past history are negative. Swelling in hands and feet and later in knees occurred three years ago, with no pain, limitation or locking. Function was still good but the trouble was increasing. The knees and ankle-joints were involved. They were swollen in appearance, with the full amount of motion, boggy on palpation, and were not tender. An incision on the inside and on the outside of the right knee was made. The capsule was much thickened, containing a large amount of serous fluid. There were many calcareous deposits in the synovia, attached to the synovial membrane, not arborescent in shape, very vascular, and purplish in color. The capsule was closed with silk. The general postoperative condition was good, and the stitches were taken out in nine days. Hot fomentations and flannel bandages were applied. A second operation was performed on February 25, 1901, both right and left knees being again swollen and painful on motion. An incision on the inside of the right knee revealed considerable gelatinous fluid, and numerous fringes, some cartilaginous. Irrigation with hot water; silk sutures for capsule closing. In seven days the stitches were taken out, and one week later the knee was somewhat painful, but it bent easily. In January, 1903, motions were normal, and there was very little swelling. The capsule seemed soft but not adherent. Both wrists now gave the patient some trouble, but the general health has greatly improved and no new joints have become involved.

Pathology.—Microscopically the specimen shows an enclosing lining of a single layer of thin endothelial cells within which is a stroma of connective tissue of normal appearance infiltrated in irregular areas of varying size with small round cells, and abundantly supplied with small vessels filled with blood. Advancing farther inward, the connective tissue becomes looser and more feebly staining, often showing granular degeneration, and the walls of the vessels show thickening. Fat cells are present only in a few isolated groups. Most of the central portion of the fringe is occupied by true osseous tissue, reached by a gradual change from fibrous tissue cells.

Case No. 5.—April 25, 1900. F. B., female, aged twenty years. Diagnosis, rheumatoid arthritis. Her family and past history are negative. The exciting cause of her present illness was trauma. The onset occurred ten years ago, and there have been some symptoms ever since. Four months ago she had a fall and she has since been unable to bend her knee or walk without crutches. There has been periodical pain, especially on walking and on manipulation, together

with swelling, but no locking. Patient walks with crutches and condition is not improving. Upon examination the right knee-joint was found to be involved, with slight swelling, and marked grating on manipulation. Manipulation also caused marked pain. An incision was made on the inner side of the right knee. The capsule was found to be thickened, though not markedly thrown into folds. The cartilages were much atrophied and eroded, and a portion of the thickened synovial membrane was removed for examination. The fringes were vascular and quite fibrous. No hemorrhage occurred. The capsule was closed with silk. No drainage; plaster dressing was used, and later the leg was put in a leather splint. The stitches were taken out in seven days. There was marked relaxation of the joint motion (passive), and it did not come back to active or voluntary motion for over a year, and then to only within about 20° of complete flexion. Normal extension was secured, and when last seen in 1902 the patient could walk very little without a cane or crutch, though she had been able to discard her leather splint. Voluntary extension was then possible.

Pathology.—Microscopically the section of a fringe shows an enclosing lining of endothelium, formed by a single layer of cells, and within, normal connective tissue infiltrated to a very slight degree by small round cells and abundantly supplied with thick-walled vessels. Progressing from the periphery, the connective tissue becomes more and more displaced by fat cells, and the vessels, which are very numerous, show changes of obliterative endarteritis. In areas of varying size there is almost pure adipose tissue, with intersecting striae of connective tissue.

Case No. 6.—August 10, 1900. J. G. M., male, thirty years of age. Diagnosis, joint syphilis. The exciting cause of his present illness is not known, the date of the onset being one and one-half years ago. The knee is not painful, and motion is free, but swelling is present and locking of joint occurs on getting up from a chair. There has been continuous swelling varying in amount, and profuse local perspiration. The left knee joint is involved. A spindle-shaped swelling appears, with a circumference over the patella $1\frac{1}{4}$ inches greater than in the right knee. The arc of motion is complete, palpation of fringes doubtful, and no tenderness present. On September 4, 1900, an incision was made on both sides of the patella, and the capsule, especially the synovial membrane, was found to be thickened. It contained one ounce of clear serum. The cartilages were somewhat eroded on the outer side. A very great number of fringes were found attached generally over the membrane, arborescent, very vascular, dark purple and soft. The capsule was closed with silk, without drainage, and a plaster dressing was applied. The post-operative treatment consisted of hot bathing, bandaging, etc. The swelling persisted. On November 19 there was an evacuation of fluid by incision. Four months after operation there

was no swelling, no limitation and complete function, but the circumference remained one inch larger than the other knee. Eighteen months after the operation, July 20, 1902, the permanent flexion was 20° , the swelling was marked, with discharging sinus of a few days' duration. The X-ray showed marked disintegration of patella with erosions on tibial condyles and crest. Specific treatment was followed by diminution of swelling and increase of joint motion, and increase of general weight. In December, 1902, a typical syphilitic ulcer appeared over the upper portion of the tibial crest, which had undermined and eaten out edges. Purulent discharge. Specific treatment was continued with great general improvement, though the ulcer persists.

Pathology.—Specimen consists of two hypertrophied synovial fringes from the knee-joint, the largest 3 cm. in length. Both of a dark purple color and very vascular, much lobulated, and irregular in outline. Microscopical. Specimen consists of connective tissue generally interspersed with fat cells. This in spots has almost entirely supplanted the former tissue. Throughout the specimen are a great number of vessels, for the most part of small size, whose walls are always thickened and whose lumina are often obliterated. Moderate amount of round-celled infiltration throughout, with three definite nodules of small round cells.

Case No. 7.—March 7, 1901. G. W., male, aged thirty-seven years. Diagnosis, trauma. The exciting cause of the present illness was a severe wrench of the right knee, with acute synovitis in a football game seventeen years previously. The onset of present symptoms began five years later with an occasional locking of the right knee and pain, with swelling following locking, and subsiding after rest. Extension was incomplete, and although locking occurred, there was normal motion on manipulation with but little pain. Swelling and pain followed moderate use. In the past year the left knee has also been slightly swollen without known cause. The right knee-joint was involved, the left also to a less extent. The right knee was much swollen and distended in appearance, and flexion was slightly limited. Nothing was palpable because of tension, except a few osteo-arthritic nodes on the inner edge of the femoral cartilage. Measurements: Circumference over right patella, five-eighths of an inch larger than left, 2 inches above patella, right $1\frac{1}{8}$ inches larger than left. Operation: Incision over the inner aspect of the joint was made. The capsule was very thick and vascular, and there was a bony spur covered with cartilage projecting one-eighth of an inch upward on margin of tibial condyle. There was a large amount of fluid. The fringes were very numerous and small, attached to the synovia, vascular, and of quite firm consistency. These and the bony spur were excised. There was no drainage and the joint was dressed in plaster for two weeks. Union per primam. Recovery was good and stitches were taken out in a week. Ma-

nipulation was performed immediately afterward, with one manipulation under gas one month later. One year later motion was a complete arc, with no swelling or pain and an excellent functional result.

Pathology.—Specimen consists of a score of hypertrophied synovial fringes varying in size from round tabs 0.5 cm. in diameter, and with very small pedicles, to irregular lobulated masses, covered with fringe-like processes, from 2 to 3 cm. in diameter. These tabs of tissue are of a fatty consistency and are yellow-white in color. Microscopical. Specimen consists of a cross section of a hypertrophied fringe. The cortex is of fibrous tissue containing many small round cells. The medulla consists of connective tissue cells staining well in some places, in others showing no nuclei, leaving the fibers thinned and separated. From this it merges apparently into fat cells which occupy much of the space. Round cells infiltrate the whole, especially in and about the cortex, where they are arranged in definite nodules. Many vessels are scattered throughout, their walls thickened, and their lumina in many places entirely obliterated.

Case No. 8.—April 7, 1901. E. M., male, fifty years; paperhanger. Diagnosis, rheumatoid arthritis. His family and past history are negative. The exciting cause of his illness is not known. The onset occurred in the ankles three years ago. He has pain, especially in walking, swelling, no locking, is unable to walk any distance, and the trouble is growing worse. The general examination is negative; the ankles, fingers, wrists and elbows are involved. Spindle-shaped swelling; lateral motion of ankles is limited almost entirely. Fringes can be felt below and in front of the outer malleoli, and the joints are quite tender to deep pressure. Incision was made in both the inner and outer side of the ankle-joint. The capsule was thickened and vascular, and fibrin was found especially in tendon sheath opened by outer incision. Fringes were numerous on the inner side of the ankle, attached to the synovia, papillomatous in shape, with an abundant blood supply, congested, and purplish in color. Their consistency was firm in some cases and soft in others. Soft dressing was used. The general postoperative condition was good, and the stitches were taken out on the seventh day. Six months after the operation, the last time the patient was seen, he could walk very much better and without pain. Motion in ankle had improved and no new joints were involved. He was improving in general health.

Pathology.—Specimen consists of two synovial lipomata, the larger 4x2 cm., rather flat, of a fatty consistency and a yellowish white color; from the ankle joint. Microscopical. Cross section of a synovial fringe, including a small portion of cortex. This cortex consists of fibrous tissue infiltrated with round cells, which in places form definite nodules of densely packed deeply staining tissues. The remainder of the section consists of areas of connective tissue and adipose tissue. Nu-

merous thick-walled vessels throughout the former. The latter is, in areas homogeneous, unbroken by connective tissue, except for an occasional vessel, its lumen entirely obliterated.

Case No. 9.—April 11, 1901. F. B. F., male, twenty-five years of age; a pattern maker. Diagnosis, rheumatoid arthritis. His family and past history are negative. Five months ago occurred the last exacerbation of an old trouble with knees dating back thirteen years. The cause of the trouble, which occurred in November, 1900, was not known. Its onset was gradual, accompanied by soreness, but no swelling. Limitation was present, but no locking, and the function was considerably diminished. The trouble took the form of an alternate swelling first in one knee and then in the other, and for treatment moderate use of joints with splints at intervals was prescribed. General condition good. Knees, wrists, elbows, ankles and shoulders were the joints involved. He had two-thirds of normal flexion in knees and within 15° of complete extension. The capsule of the knee was clearly outlined by swelling and was tender to the touch. In October, 1902, a double lateral incision was made in both knees, showing the synovial layer much thickened and very vascular, containing no excess of fluid and some fibrinous clots. There were a large number of fringes with a synovial attachment, arborescent, very rich in blood supply, of dark reddish-purple color, and mostly soft, but some were fibrous. No hemorrhage occurred and ligatures were not used. The wound was irrigated and the capsule closed with silk, not drained, and dry dressing, but no plaster, applied. The postoperative treatment consisted of tonics and massage. In one week the stitches were taken out and the joint manipulated, and after that manipulation was given daily. In two weeks motion was better than before the operation, as just before the operation the patient could not extend the knees within 45° of straight. In May, 1903, manipulation was possible to within 20° of complete flexion, and 15° of complete extension. There was a slight swelling of the knees and considerable soreness. In the knees the result has been a marked improvement in function, but they are still painful. There is very much less swelling. The general disease has, however, been extending, and other joints are worse.

Pathology.—Specimen consists of a score of hypertrophied synovial fringes from the right knee-joint, internal aspect as well as external. They are of varying shades of purple, and consist as a rule of long slender pedicles from the distal end of which start numerous fringe-like processes, 2 to 3 cm. in length, fine and delicate, and very soft. In addition several large white masses of fibrin, the longest 7-10 cm. in length, also irregular in shape and with long narrow processes. Microscopical. Longitudinal section of hypertrophied bulbous outgrowth. Periphery consists of a densely packed layer of very small round cells to the exclusion of other tissue. Medullary portion composed of adipose tissue, with

some small areas of fibrous tissue, traversed by numbers of vessels cut longitudinally, radiating from base to cortex. No apparent endarteritic changes. Specimens from left knee of similar character.

Case No. 10.—September 10, 1901. A. A. E., female, aged forty-three years. Diagnosis, osteo-arthritis. The patient has been troubled for many years with pronated feet and has worn plates. No cause is known for her present illness, but for several years on rare occasions has had a catching sensation in right knee. Acute onset of symptoms occurred six months ago, attended with pain and, during the past month, swelling. There has been no limitation of motion, but a catching in the right knee, referred to inner lower edge of patella. Patient walks with a limp and the course of the trouble has been progressive. Examination shows both knee-joints to be involved, the right knee swollen one inch larger than the left above the patella and three-quarters of an inch over patella. The motion is normal but guarded. A diffuse swelling present, but no fringes palpable. Joint is tender on pressure. Two operations were performed on both knees, the first in December, 1901, and the second in March, 1902. An internal lateral incision showed that the capsule was much thickened and congested, with no excess of fluid. Very numerous fringes from the whole membrane, the largest about the lateral edges of the patella and the ligamentum alae, were attached to the synovia. These were very vascular, purple in color and soft. There was also an osseous ridge on the femur. A considerable hemorrhage took place. No ligatures or irrigation. The capsule was closed with silk, not drained, and plaster dressing applied. The general postoperative condition was good, and the stitches were taken out in seven days. Later one knee was manipulated with ether, and bandages and applications were used in treatment. Function was regained slowly. In October, 1902, the arc of motion was normal, the swelling slight, walking somewhat painful, but the functional result good.

Pathology.—Difficult to exactly orient position of tabs, but usually can make out broad base and edematous and vascular tabs projecting into joint. Base consists of closely interwoven bundles of very dense fibrous tissue in which are a very few spindle-shaped nuclei. Among the fibers are often seen small groups of large oval or round spaces—fat spaces—with at times very large, rather thick-walled blood vessels. About this dense base, *i.e.*, toward joint surface, is a layer of less dense and more vascular tissue, forming either rounded or sessile projections into the joint, or long finger-like papillæ. The layer of tissue between the very dense base and the projections consists of very edematous tissue, in which are fat spaces of large size, and many relatively young blood vessels. In this edematous fibrous tissue are a considerable number of lymphoid and plasma cells. Blood-vessel walls are quite thick and show considerable infiltration with lymphoid cells. The layer of edematous fibrous

tissue may form a layer between the dense base and the surface of the capillary growths, or may extend into the finger-like papillæ to form a central stalk. At times the infiltration of lymphoid cells about the blood vessels is very marked. Rarely in a long papilla is a small area of osteoid or osseous tissue. No definite endothelial layer can be made out. The surface layer consists of a layer of closely packed cells, with oval or round nuclei and much intercellular fibrillar material, and no sharply defined protoplasm (fibroblasts). The superficial layers of the papillæ often are very vascular. Sometimes on joint surface of tabs is considerable fibrinous exudate. Sometimes base contains much fat tissue.

Case No. 11.—December 19, 1901. H. L. F., male, twenty-four years of age; student. Diagnosis, osteo-arthritis. His family and past history are negative. The onset occurred seven years ago, with swelling of feet and ankles. The patient felt pain after standing a long time; limitation; no locking; and the trouble was chronic. The treatment consisted of splints and plates. The left ankle joint was involved and had a swollen appearance about the external malleolus. Varus, only a partial correction of which was possible, and tenderness were apparent. On December 21, 1901, an incision was made over the peroneal tendons and calcaneo-cuboid articulation. Two or three fringes were found attached to the synovial membrane, irregular in shape, vascular, reddish purple in color, and of a soft consistency. The fringes and osteo-arthritic ridges were excised through an incision over the calcaneo-cuboid articulation. The osseous spur came from the cuboid. There was no draining and a soft dressing was applied.

The patient has walked freely and without pain ever since convalescence was fully established, *i.e.*, four weeks after the operation. He has had no trouble since in this foot.

Pathology.—Tabs of soft tissue consist of very vascular and dense fibrous tissue with, in places, small circular areas of lymphoid cells. Also fat tissue, in places infiltrated by much fibrous tissue.

Case No. 12.—January 4, 1902. A. F. G., young married woman. Diagnosis, relaxed joints. sudden increase of weight. Negative family and past history. The onset occurred immediately after confinement, June, 1901. Patient had pain and disability in right knee, followed by similar pain in left knee to less extent, with pain, locking, and painful walking. Following rest in bed, there was a disappearance of pain and symptoms, which have reappeared recently, coincident with pregnancy. Plates and strappings were applied. Patient is a large, stout woman, with pronated and relaxed feet. The knees, especially the right, were found to be involved, and in appearance there were soft, fatty, irregular masses to be felt. The amount of motion was nearly normal, and deep, freely movable fringes could be palpated. There was tenderness over the outer side of the joint. On April 25, 1902, an incision was made on the outer aspect of both knees. The capsules were nearly

normal, except over the bases of the fringes where they were somewhat thickened. There was no excess of fluid or fibrin. Two fatty masses were found, each 4 cm. in diameter, on the outer aspect of the joint, extending below the patella, attached to the synovia by a pedicle, but also loosely attached over the entire base. They were irregular, flat, sessile, with an abundant blood supply, yellow-red in color, of a fatty consistency, but with some fibrous resistance. There was also a large succulent fringe from below the patella. No ligatures or irrigation. The capsules were closed with silk. No drainage, and soft dressing. The stitches were taken out on the seventh day. Daily active and passive manipulation was performed. Hot and cold douching and flannel bandages. On May 13, 1903, the amount of motion in the right leg was a right angle and within 10° of a right angle in the left leg. Swelling was slight, with no pain, and on this date, two weeks after the operation, the patient was walking very well.

Pathology.—Specimen consists of two irregular, lobulated masses of tissue, 4x2.5x2 cm., and 4.5x3.5x1.5 cm., respectively, and one smaller, 2x1.5 cm., of fatty consistency, yellow or grayish-white in color, with some portions of reddish hue. Over portions a thin fibrous coat remains, resembling the superficial layer of synovia. The growths are sessile and against joint wall lies a broad base of yellow fatty nature. One portion of each, resembling a pedicle, and probably the original point of union with synovia, contains visible vessels, and considerable fibrous tissue. Similar smaller tab. Microscopical. Specimen consists of a thin cortex of fibrous tissue infiltrated to a considerable extent by small round cells, within which is a broad layer of normal fibrous tissue interspersed with very numerous small vessels filled with blood and with marked surrounding round-cell infiltration. The remainder of the section is composed of normal adipose tissue, interspersed by irregular striae of fibrous tissue, especially about the vessels which are very numerous, many of considerable size, and all having marked endarteritic changes; walls greatly thickened. In smaller vessels is entire obliteration of lumina.

For Cases 13 to 16 see *Boston Medical and Surgical Journal*, March 19, 1903.

Case No. 17.—April 22, 1902. C. W. W., female, forty-nine years of age. Diagnosis, relaxed joints. Patient has a history of nervous prostration six years ago. Her present illness began in July, 1901, the exciting cause being a twist of the knee on alighting from a carriage. This was accompanied by pain, swelling, no limitation of arc but with locking and limited function. Patient had been treated with electricity, massage, strapping, heat, etc. A very heavy woman; both knee-joints swollen, especially below the patella, and on either side of the patellar tendon. Motion was quite free, fringes could be felt, and there was no tenderness. On April 2, 1903, an incision was made over the outer side of both knee-joints.

In the left was found fatty degeneration of a portion of the membrane en masse. There was no excess of fluid and no fibrin and no general villous enlargement. The lipomata were attached to the outer upper aspect of both joint cavities, were irregular and flattened in shape, and supplied with blood from the synovia. They were yellow in color and of a fibrolipomatous consistency. The hemorrhage was slight. Ligatures and irrigation were not used and the capsule was closed with silk. The wound was not drained and a soft dressing was applied. A good recovery followed and the stitches were taken out in one week. Neither manipulation nor bandages were necessary, for the patient recovered her motion voluntarily and function was restored in two weeks. In May, 1903, the amount of motion was normal, with no swelling, but some soreness, and an excellent functional result.

Pathology.—Three fatty masses, lobulated, sessile and attached to synovial membrane by a pedicle; irregular in shape and lobulated, gray-red with streaks of red, the largest 8x2.5 cm., the second 3x2, the third much smaller. Fatty fibrous consistency. Microscopical. A very thin cortical layer of connective tissue densely infiltrated with small round cells, the endothelial lining occasionally apparent. The bulk of the section occupied by adipose tissue with irregular striae of feebly staining connective tissue and numerous vessels in varying stages of obliterative endarteritis.

Case No. 18.—May, 1902. J. W. B., male, forty years of age. Diagnosis, trauma. The patient has a history of rheumatism in the knees ten years previous. In November, 1901, he struck his left ankle with a hammer, and pain and swelling of ankle with limitation of motion immediately followed, without locking of joint. Patient walks with crutches and the trouble is progressive. The left ankle-joint is involved, thickened in appearance, about the malleoli and in front of the peroneal tendons. Motion is limited. Position of valgus. Fringes could be felt rolling under the palpatting finger and were somewhat tender to pressure. An excision of the fringes was made, incisions being above and below the malleolus, parallel respectively to tendons of tib, anticus and peronei. The capsule was much thickened and very vascular, and contained no fluid or fibrin. There were several fringes attached to the synovia, profusely supplied with blood, and of a soft consistency. The treatment consisted of irrigation and curettage, with silk to capsule, no drainage, and plaster dressing. Healing per primam and an excellent functional result. There has been a recurrence of the trouble in the knees. No histological examination of the specimen was made.

For Case 19 see *Boston Medical and Surgical Journal*, March 19, 1903.

Case No. 20.—June 19, 1902. O. L. P., female, aged fifty-seven years. Diagnosis, osteo-arthritis. Her family and past history are negative except for some fleeting rheumatic troubles. The ex-

citing cause of her present illness is an injury to the left knee four years ago when patient sat for over an hour with her left knee curled under her. This was followed by pain, swelling and impaired function without locking of joint. Knee has troubled her ever since to a greater or less degree. No systematic treatment was used. On general examination some slight evidences were found of osteo-arthritic changes in hands. The left knee-joint was involved and appeared swollen below the patella on the inner side. Motion is possible to a right angle in flexion, 10° less than normal extension. A fringe is palpable below the patella and on the inner side, with tenderness over this area. A lateral incision was made over the inner side of the knee, which revealed a normal capsule with no excess of fluid and no fibrin. There was one fringe from the lig. alæ on the inner side, irregular in shape, with a blood supply from the synovial membrane; pale in color, firm and fibrous in consistency. No hemorrhage occurred, no ligatures or irrigation. The capsule was closed with silk, was not drained; dry, soft dressing, no plaster or splint. Massage and tonics were prescribed. In one week the stitches were taken out and manipulation was given. Flannel bandages were also used. Two and one-half weeks after operation 50° of motion were obtained. In May, 1903, the amount of motion was a right angle, with no swelling or pain, and a very good functional result.

Pathology.—Three small synovial tabs, the largest 1.5 cm. in length, with a broad base and tapering out in tongue-like projections. Smaller tabs similar; grayish-red color. Microscopical. Only a small amount of the cortex present, which shows, however, a thin endothelial lining, with connective tissue basis, dense round-celled infiltration, and numerous thick-walled vessels. The interior portion of the growth consists of adipose tissue, bands of irregularly arranged connective tissue, and vessels in large numbers. The larger have thick endarteritic walls, and the smaller are for the most part occluded, and there are numerous vessels of very small size cut longitudinally, which also show occlusion.

Case No. 21.—August 24, 1902. J. P., female, twenty-three years of age. Diagnosis, acute arthritis. She has a history of abdominal pain, weakness and leucorrhea of two years' standing. There is no known exciting cause for her present illness, the onset of which occurred thirteen months ago, with swelling of the left knee. Four weeks later the leg suddenly gave out under her and she was in bed with an attack of monarticular arthritis for twelve weeks. The trouble is accompanied by swelling, slight limitation, locking, and the patient walks painfully and with a limp. The condition remains stationary. Counter irritation and massage were prescribed. Patient very neurotic. The left knee-joint was involved, swollen in appearance, 2 cm. greater than the right, with 120° of flexion, fluctuating and hot on palpation. Marked tenderness existed. On August 27 an incision was made over the outer aspect of the

joint. The capsule was thickened and 20 c.c. of turbid fluid were found. There were several small fringes, two of which were removed, each about 2 cm. long. These were attached to the synovial membrane, were tongue shaped, had a marked blood supply, and were soft to fibrous in consistency. Slight hemorrhage. No ligatures were applied and treatment consisted of hot corrosive irrigation, with a silk capsule closing, no drainage, and dressing of plaster in extension. The general postoperative condition was fair and the stitches were taken out in eight days, and manipulation was given at the same time, with split plaster, flannel bandages, etc. After the plaster was omitted the leg became painful with a tendency to flex at the knee. A caliper splint was applied in October. At this time a similar attack in the right knee was treated with plaster cast and rest. Symptoms greatly decreased in three weeks when the patient was discharged. Patient has not been seen since.

Pathology.—Specimen consists of an hypertrophied fringe from the knee-joint, anterior inner aspect, very vascular, purplish in color. Microscopical. Bulk of section consists of normal connective tissue. In a few places there are areas of round-cell infiltration which is not, however, general, and there are one or two small lumps of fat cells, with occasional vessels scattered throughout the tissue. There is no evidence of hypervascularity.

Case No. 22.—September 3, 1902. K. F., female, sixteen years of age; saleswoman. Diagnosis, acute arthritis. Patient has had a recent history of gonorrhea. There has been no trauma. The onset of the present illness occurred one month ago with acute painful swelling of the left wrist and hand, followed immediately by pain and swelling of right knee. There was sharp pain, marked swelling, complete limitation in flexion, no locking, and patient was unable to use leg. The symptoms increased in severity, and rest in bed, with local applications was prescribed. On general examination the patient was found to be thin and anemic, with irregular temperature, up to 102° F. The right knee-joint was involved. In appearance it was symmetrically swollen, flexed 30° and abducted. Circumference 6 cm. greater than the left. Patient had great pain and muscle spasm on attempted motion, attended with fluctuating palpitation and marked tenderness. On September 8 an incision was made over the inner aspect of the right knee. The capsule was very thick and vascular and contained considerable fluid with fibrin flakes and blood clot. The fringes were small and few and the synovial surface mostly smooth. These fringes were attached to the synovial membrane, were tongue shaped, had a marked blood supply, were reddish-purple in color, and of soft consistency, but with resistance of fibrous tissue. A slight hemorrhage occurred. No ligatures were used, but hot corrosive irrigation was tried, and the capsule was closed with silk. No drainage. Plaster in extension. The general postoperative condition was fair and the

stitches were taken out in eight days. The knee was very tender to manipulation and the patient hysterical. The treatment consisted of continuous daily manipulation with or without ether, split plaster, hot fomentations, flannel bandages, and regular massage later. In March, 1903, the arc of motion was complete to within 10° of complete extension, with no swelling or pain, and an excellent functional result.

Pathology.—Specimen consists of two hypertrophied tabs of synovial membrane, taken from the lower inner aspect of the knee-joint. The larger is 2.5 cm. in length. All are of a dark purple color and very vascular. Very soft and yielding in consistency. Microscopical. Connective tissue throughout, with general slight small round cell infiltration which in places becomes more dense. Vascularity marked but no endarteritic changes apparent. No adipose tissue, or scattered fat cells present.

(To be Continued.)

TREATMENT OF TAPEWORM.*

BY SAMUEL P. GERHARD, M.D.,
OF PHILADELPHIA.

In the treatment of tapeworm there are three species most commonly met with. They are the beef tapeworm or *Tenia saginata*, the pork tapeworm or *Tenia solium* and the broad tapeworm or *Bothriocephalus latus*. The beef tapeworm occurs more frequently in this country than in the others, while the pork tapeworm and the broad tapeworm are comparatively rare. The manner in which they find lodgment in the intestines of the human being is now so well understood, that the means of prophylaxis, both on the part of the individual and the government are so simple and effective that they need merely be mentioned here.

On the part of the individual, the means of prevention are to see that all meats are properly and thoroughly cooked before being eaten; and on the part of those who by occupation are required to handle meats, perfect cleanliness in every respect should be the rule. The regular and systematic inspection of cattle that are set aside for food purposes, and the meat after it is prepared for the market, should be rigidly carried out by the government.

By these means the prevalence of the disease is greatly lessened and reduced.

The worm is exceedingly difficult to remove and the half dozen or more remedies that are useful are more or less efficient. They are administered regardless of the particular species of tapeworm, so that we need only consider the treatment as applied to all.

There is probably no branch in the practice of medicine that has been carried on more successfully by the fakir and the advertiser than the removal of tapeworm. This class of practitioners seem to meet with much success and there is no

doubt but that they do apply their remedies to remove the worm surely. At one time this work was almost entirely in the hands of non-professional persons, or so-called worm doctors, who applied their apparently secret remedies for large fees.

As for the regular practitioners, we have in our possession several good and efficient drugs, and the best one is probably the ethereal extract of male fern. However, the selection of a remedy is a matter of preference and experience and depends chiefly on the purity of the drug used and the method of administration.

The preparation of the patient is a most important matter and requires to be carefully and completely carried out to effect an expulsion of the worm.

Most authorities agree that twenty-four hours before the administration of the medicine the patient should be required to fast and have the bowels thoroughly emptied and washed out by means of purgatives. This allows the drug to come in direct contact with the parasite without the interference of food that may be in the bowel.

Besides the male fern just mentioned, we have a powerful vermicide in the drug Kooso, the dried flowers and immature fruit of the *Brayera antehelmintica*, a tree of Abyssinia. These two drugs have been used from time immemorial and have done good service.

Kooso, however, is liable to produce severe nausea and vomiting in some cases.

The bark of the root of the pomegranate is also efficient, together with its alkaloid, pelleterine, named in honor of the chemist Pelletier.

These are very unpalatable drugs and may cause toxic symptoms in doses large enough to be effective.

Oil of turpentine, at one time was much used and is very powerful but on account of the difficulty of administering it and its nauseating taste, it is very little used, except as a last resort. It must be combined with castor oil to be of any active use and the quantity used is two ounces of oil of turpentine with four of castor oil; together we have a horrible dose, enough to scare our patient from us.

Kamala is a very active drug but is not often used, for the reason that it causes nausea and vomiting.

A very valuable remedy is pumpkin seeds, especially in children. It is harmless and easily taken when powdered and mixed with sugar. Others can be mentioned, but they are not as certain in their action and are more unpleasant than those named.

The whole worm must be expelled with its head and segments, entirely and completely, or it will develop again in from six to eight weeks, for if the head still remains in the intestines it will be necessary to repeat the treatment on the appearance of the parasite.

The great drawback to nearly all the methods of treatment in this condition is the large doses of medicine required and the loss of time to the

* Read before the Northwestern Medical Society, Philadelphia, May 5, 1903.

patient from his occupation during its application. In looking over some of the formulas that are highly praised and which seem to be largely used by many regular practitioners, we find the dose measures a pint or more of a bitter and nauseating mixture which has to be taken at one or two draughts.

In delicate, weak and debilitated patients this is a serious matter and the treatment then becomes almost barbarous.

In these days of elegant pharmacy and improved methods of administering drugs, there is no need to hold on to the old, yet efficient, methods but turn our attention to applying these same old remedies in a better and much more acceptable form.

To this end I have found a combination of two of the drugs mentioned, namely male fern and pelletierine, most suitable and applied in the following manner:

There is no necessity for the patient to make several days' preparation. The loss of one meal-breakfast—is all that is required. In many cases the most convenient day to select for giving the medicine is Sunday, for the reason that most patients are at leisure at that time.

Instruct the patient to clear out the bowels the day previous, with one or two large doses of castor oil or salts. One dose may be given in the morning and one at night, an hour or two after a light supper.

The next morning, as early as possible, say at six o'clock, give at one dose a pelletierine tannate, 20 grains, in two capsules. When this has operated freely, in about two or three hours begin with the following:

B. Olii resinæ aspidii.....	3 <i>ii</i>
Aetheris	3 <i>ii</i>
Hydrarygi chloridii mitis.....	gr. xii
M. et div. in capsulae No. xvi.	
S. Two every ten minutes.	

Of course it is understood that no food is taken during this time. In about two or three hours the worm will be expelled whole, with its head fastened to its neck.

Recently, in seven cases, I have found this method to give successful results without any recurrence. It is generally difficult to find the head on account of its small size and one cannot give assurance that there will not be a return of the parasite unless the head is found, or after the lapse of six or eight weeks when no segments are found in the stools.

It is well to instruct the patient to pass all bowel movements into a vessel of warm water on the morning the medicine is taken. In this way the worm can be secured when it is passed and saved for examination. No traction on the protruding worm should be permitted for fear of tearing the head off and losing it.

The patient can then rest and if there is any depression light food may be allowed. This depression is slight and I have never known it to last longer than two hours.

X-RAY TREATMENT OF CANCER OF THE UTERUS. METHOD AND RESULTS.

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THE term X-ray treatment is used to emphasize the author's belief that the X-ray is the only form of radiation likely to do much good for these cases. The ultraviolet ray is all right in its place, but that is only for lesions which are less than skin deep and no matter what kind of speculum is used the ultraviolet ray is not going to penetrate the tissues of the cervix sufficiently to influence a cancer of that part. As we know, even for lupus we have to blanch the skin to secure sufficient penetration for even this cutaneous affection. With all the infiltration which takes place about the cervix the ultraviolet ray seems to the author practically useless.

For applying the X-ray a prime requisite is a good examining table with leg crutches for a lithotomy position. The patient lies on her back with her hips at the edge of the table, the thighs vertical and legs horizontal, resting on the crutches which are about 18 inches high. A sheet covers everything but the vulva and after the speculum is introduced sheet lead is spread over the buttocks and thighs to protect them from the X-ray. The speculum most generally useful is Nott's. It is of metal and of the general shape of a bivalve speculum with a duck-bill posteriorly, but with two narrow arms anteriorly which spread apart as they are both separated from the posterior blade. The tissues most usually involved along with the uterus are reached through the anterior vaginal wall in this way. The specula, Ferguson's, made of celluloid are transparent to the X-ray and are desirable for some cases with extensive infiltration.

The X-ray tube ought to be a large and powerful one—the author's are all of 40 cm. capacity, i.e., intended for use with a current producing a 40 cm. spark, and should be of medium hardness. By hardness I mean a high degree of vacuum and all the best tubes are provided with an arrangement whereby the gaseous contents of the tube may be added to when the tube becomes too hard. For these cases the tube and the current should be so adjusted that the bones of the hand may be faintly seen at a distance of two feet from the tube. The author uses a coil with a liquid interrupter to excite the X-ray tube.

The distance ought to be about nine inches from the anticathode, the disk in the center of the tube from which the rays radiate, to the nearest exposed surface; and for a beginning exposure the time ought not to exceed five or six minutes of actual X-radiation. This will probably have to be interrupted once or twice to allow the tube to cool. The time is generally increased at subsequent treatments until finally this part of the treatment takes twenty minutes, during nearly half of which the X-ray is actually shining.

The second part of the treatment is required for

those cases, and they are the usual ones, in which there is a fibroid or other tumor of the body of the uterus.

The patient may be sitting up and the X-ray tube is placed about nine inches from the surface and directed at the tumor right through the abdominal wall. It is rather better to have the surface of the abdomen uncovered, so that we may judge of the condition of the skin, it ought to become somewhat tanned after repeated exposures, but burns and ulcerations do not seem to do anything but harm. The time of exposure here may be about nine minutes, distributed over different portions of the lower abdomen.

The third part of the treatment consists in the application of the high tension discharge by means of vacuum electrodes. From one pole of the X-ray coil a rheophore passes to an insulated handle in which there is a metallic socket and in this is fitted a vacuum tube with a bulbous extremity. No connection is made with the other pole of the coil. The free end of this vacuum tube, essentially a Geisler-tube, is placed upon the surface of the abdomen over one of the painful spots and a current strong enough to produce a four-inch spark is turned on. The tube becomes filled with a series of waves of light passing from the rheophore down into the body of the patient and with absolutely no disagreeable sensation. In moving the vacuum tube from one part of the abdominal surface to another we try to keep it in contact with the skin, as otherwise the patient receives a shower of sparks which are more or less disagreeable. Then again, while this application is being made no one should touch the patient, as she is quite intensely charged with electricity and receives a spark from contact with anything that is a good conductor. The efficacy of these tubes is entirely out of proportion to the simplicity of their construction and application. Of course we know they have a coil behind them containing a hundred thousand feet of wire and capable of giving a voltage of a million. So, after all, it is not strange that they should produce very tangible effects.

The results which may be expected are wonderful. The vacuum tubes bring about complete relief from pain and the entire treatment results in a cessation of the discharge, disappearance of the odor, which in these cases is often most offensive, and a restoration to general health. The fibroid diminishes somewhat in size and the progress of the carcinomatous infiltration is arrested. Each treatment acts as a general tonic and the patients often declare that they would be treated every day if they could afford it.

The cases the author has treated or recommended treatment for in this way have been cases in which the surgical removal of the disease has seemed impossible, or has been unsuccessfully attempted. In these cases there has been a symptomatic cure. The author has as yet formed no opinion as to the possibility of a complete disappearance of uterine cancer under X-ray treatment.

WHY NOT ABSOLUTE PRECISION IN CHYME ANALYSIS?

BY MARK L. KNAPP, M.D.,
OF NEW YORK CITY.

WITH this article I intend to establish three facts:

First: That at present no better indicator is known for the quick and absolutely correct determination of free hydrochloric acid than is the supersaturated alcoholic solution of tropeolin oo. This solution is most excellently adapted for very accurate clinical purposes.

Second: That the dimethylamidoazobenzol as an indicator for only free hydrochloric acid in chyme is absolutely wrong, consequently misleading and hence causes mistaken diagnoses. But that as it reacts also on *very weak solutions* of organic acids it can be used for the quantitative determination of such acids; and

Third: That by the successive use of tropeolin, dimethyl and phenolphthalein in the same specimen of chyme we can determine, quantitatively, free hydrochloric acid, organic acids and the general acidity. My experiments regarding these questions I have published in my article, "Some New Facts in the Chemistry of the Stomach" (*American Medicine*, March 22, 1902). I experimented with the other known indicators, but could obtain no better combination or a combination equally as good. This combination has the merits of accuracy and practicability. The end reaction of each of these indicators is quite sharp.

The tropeolin solution is prepared by throwing into absolute or very strong alcohol an excess of the powder of tropeolin oo and leaving it stand for two or three days, during which time the solution is shaken up a few times. Such tropeolin solution is of a dark, cherry-red color, resembling the color of the tincture of iodine. Free mineral acids are colored a purplish red by a few drops of this solution.

That this tropeolin solution is absolutely reliable I have proven in my above-mentioned article. The results obtained with the tropeolin were corroborated first by Vollhard's method, and second by Günzburg's reagent. Whenever tropeolin showed free hydrochloric acid, Günzburg did likewise, and vice versa. To furthermore test the value of the tropeolin solution I have many times tested the chyme with Günzburg, after the end reaction was reached by tropeolin, but in each case with negative result. Again I tested the exactness of the tropeolin in the following way: Chyme was titrated with tropeolin as the indicator, e.g., I got the end reaction corresponding to an acidity of 15. I then took another specimen of the same chyme and added the decinormal sodium hydrate to correspond to an acidity of 12. I now tested with Günzburg, which proved positive. I then added some more caustic soda to correspond to an acidity of 18; now Günzburg gave negative result. In this way, I believe, I have ascertained the undoubted correctness of the tropeolin solution as an indicator for free hydrochloric acid, this

solution giving exact results, neither too high nor too low.

To 5 c.c. of the filtered chyme are added two drops of the tropeolin solution. If free hydrochloric acid is present the stomach contents are colored a purplish-red, the intensity of which depends upon the quantity of the free hydrochloric. The titration is begun with the decinormal solution of caustic soda in the usual way. When the end reaction has been reached the contents in the beaker are of an amber color. While titrating it is best to look down upon the angle formed by the wall of the beaker with its bottom, and we continue to add drop by drop of the decinormal solution of the caustic soda until this angle shows no more red. Like everything else, this needs some practice, and for the purpose of practicing a solution of hydrochloric acid may be taken, the strength of which is previously ascertained with phenolphthalein. Knowing the strength of such a solution, another specimen is again titrated, using now the tropeolin as indicator. Exactly the same quantity of caustic soda is added as in the last specimen and the color of this and the reaction is carefully noted. Thus it is easy to make oneself acquainted with the end reaction of tropeolin. If but very little chyme is at our disposal we can ascertain the presence of free hydrochloric acid by dipping a piece of clean filter paper into the chyme and then drop one drop of the tropeolin on the wet filter paper, when the characteristic color will appear.

Now, as to the second proposition that dimethyl as an indicator for only free hydrochloric acid is absolutely wrong. In my original work (cited above) I have proven that dimethyl not only reacts on free hydrochloric acid, but also on very weak solutions of organic acids, nay, even on the weak solutions of acid salts, as on the acid phosphates of magnesium and of calcium. The strength of the organic acids with which dimethyl reacts comes entirely within the range of the normal acidity of the stomach, and not as it has been supposed, that dimethyl reacts only on strong solutions of the organic acids. Knowing these facts, how dare we advocate the dimethyl as indicator for only free hydrochloric acid? Why still advocate something admittedly not entirely correct when another reagent, absolutely correct, can be used just as easily? We have lulled ourselves into the belief that the amount of the organic acids in the chyme after a test breakfast, unless in dilatation of the stomach, is very insignificant. But this is not so. Neither is it true that there can be no large amount of organic acids when there is enough of free hydrochloric acid. I have proved in the table, given in my article, "Gastrosia Fungosa" (*American Medicine*, Jan. 10, 1903), that both free hydrochloric acid and organic acids may, and in a very great many cases do, co-exist. In the great majority of the cases of hyperacidity the hyperacidity is caused by the organic acids only. Organic acids are very often present in large quantities to the exclusion of free hydrochloric acid. Dimethyl, in these cases, proves ab-

solutely positive, and its index is then interpreted as that of free hydrochloric acid, which it is not. Whenever tropeolin proved negative, Guinzburg or Boas' solutions likewise proved negative, although the dimethyl gave the ordinary red color. This fact is exemplified in Cases IV, VI and IX of the table of my monograph lastly mentioned. And how easy is it to demonstrate the presence of the organic acids, a procedure which requires little apparatus and little time. A Straus separatory funnel and a narrow test-tube constitute the apparatus, a 10-per-cent. solution of ferrichlorid and ether are the reagents. The entire process of demonstrating the organic acids consumes about two or three minutes. One c.c. of the filtered chyme is put into the separatory funnel and four c.c. of ether are added. The ether is then shaken up with the chyme to extract the organic acids. One drop of the 10-per-cent. solution of the ferrichlorid is added to two c.c. distilled water in a narrow test tube and upon it is floated the clear ether extract. At the plane of junction of the ether with the iron solution a colored ring appears which varies with the different acids as described in my original article. (One must be sure that only the clear ether extract is floated, as the floating of even a small quantity of chyme may simulate a somewhat yellowish ring.)

Wherever the dimethyl proves positive after the end reaction of tropeolin has been reached the floating test for organic acids should be applied to corroborate the presence of the organic acids. (This floating test does not react with the mineral acids or with the acid phosphates of calcium, magnesium, potassium and sodium.) The knowledge of the presence of organic acids is absolutely essential, as upon their ratio and their relation to the free hydrochloric acid depends the correct understanding of the case, and hence the correct therapy. The presence of organic acids in the chyme can also be ascertained through the microscope, by the presence of a large quantity of fungi. Here again we meet with the old supposition that in the presence of free hydrochloric acid there can be no microbes. It is about time that this nonsensical supposition, that so-called micro-organisms cannot coexist with free hydrochloric acid, be forever exploded. Anyone still asserting such imagination convicts himself of ignorance of the exact facts; such an assertion proves that its author is but little acquainted with the microscopic picture of chyme. As a matter of fact, I have grown pure cultures of the supposed micro-organisms among others, also in *free* hydrochloric acid. Alas, for the present pernicious theories and doctrines of bacteriology; how unfortunately so grand a study is still being misinterpreted.

From the fact that in the supersaturated alcoholic solution of tropeolin we have, so far, the best indicator for free hydrochloric acid, and that the dimethyl reacts also on weak organic acids I have combined the two, successively, in the same specimen of chyme for the very easy and quick determination of both, free hydrochloric acid and of organic acids. And, after the end reaction of

dimethyl—a pale yellow color—has been reached we can add phenolphthalein for the determination of the total acidity and continue the titration until the characteristic carmine-red color appears. We are thus enabled to determine in the same chyme specimen, qualitatively and quantitatively, free hydrochloric acid, organic acids and the general acidity. The time consumed for such determination need not exceed ninety seconds to two minutes, a process surely rapid enough for clinical purposes.

Let me now review a few statements made since the publication of my above first-mentioned article.

A. L. Benedict (*American Medicine*, July 19, 1902) praises the dimethyl and wants us to be particular in observing the successive color changes from the red to light lemon-yellow. He advises us to watch the change of red into orange, which is supposed to be the end reaction for free hydrochloric acid, the subsequent transitions into pale yellow denoting organic acids. I wish it were so. While in many cases the addition of the dimethyl to the chyme, after the end reaction of tropeolin was reached, did give no other color but orange red, in many other cases the pure carmine-red color became instantly manifest. This depended simply upon the quantity of organic acids present. The greater the quantity the deeper red the color. The statement of Dr. Benedict that tropeolin gives too high readings is not borne out by facts. If one is thoroughly acquainted with the end reaction of the tropeolin he will find that the determination with tropeolin and with Boas' or Günzburg's reagents give identical readings. Dr. Benedict wants us to deduct as an "average" 15 per cent. from the reading at the end of the dimethyl reaction, to give us "a fair idea" as to free hydrochloric acid. Are we called upon to give "fair ideas" and "fair averages" or are we to give absolute facts? We are assured that the organic acids are due to fermentation; does it make no difference to know how far the fermentation has proceeded? Are we to assume as being immaterial whether we have only 5 per cent. or 80 per cent. of organic acids?

Charles P. Emerson (*Johns Hopkins Hospital Bull.*, January, 1903) recommends Congo paper as an "excellent" indicator for free acids. Unfortunately my experiments are against the correctness of such statement. Congo paper likewise reacts on organic acids; for instance, it gave a positive reaction with malic acid of as low an acidity as 20. He further says, where free acid is present, the amount of free organic acids *likely* to be present will not disturb results. I should like to refer to Case VII in the table of my article, "Gastroia Fungosa" (*American Medicine*, January 10, 1903). This case shows free hydrochloric acid 26, and free organic acids 52. Of course, this is not the only case on my records. Dr. Emerson also says, that although it (Günzburg's reagent) is the most delicate test, the amount of hydrochloric acid indicated by it is less than by other indicators. There is excellent reason for

that, because—the supersaturated alcoholic solution of tropeolin excepted—all the other indicators react as well with acids other than the free hydrochloric acid. Consequently, while Günzburg ceases to act after the neutralization of the free hydrochloric acid the other indicators still continue to operate on the organic acids.

W. F. Skillman (*American Medicine*, April 18, 1903) labors under the supposition that organic acids are to be suspected only when there is interference with the size, position and peristalsis of the stomach, to which I take exception. He also reiterates what has been said before him, that the dimethyl reacts on organic acids only when these exist in large quantities. Surely, I thought I had utterly disproven this misleading and erroneous contention when I demonstrated that organic acids of as low acidities as 15 reacted with dimethyl. He also argues, "Then we could suspect the presence of organic acids and could use the Günzburg or Boas reagent to determine whether our dimethyl reaction was caused by organic or inorganic acids." But suppose that both these acids are present simultaneously, does he then want to exclude the presence of organic acids because Günzburg and Boas give the reaction for free hydrochloric acid, which is also present? He further says, "If the stomach is normal (size and position) . . . then dimethyl will give *fairly accurate results*." What is meant by "fairly accurate" results? Both the patients and the general practitioner want *absolutely* accurate, not fairly accurate results. And, when absolutely accurate results are clinically so easily obtainable, we should be satisfied with nothing less than absolutely accurate results.

Einhorn (*N. Y. Medical Journal*, May 9, 1896) has also proved that the dimethyl reacts with very minute quantities of lactic acid.

Summary.—I want to reassert that, while dimethyl reacts very sharply on free mineral acids, it also reacts on other very weak acids; it reacts on such degrees of acidities of acids other than hydrochloric acid as are absolutely within the bounds of even a subacid stomach. That the supersaturated alcoholic solution of tropeolin stands in no way behind the reagents of Günzburg and Boas, but that it has the additional advantage over these, inasmuch as it can be used for titration, and this with absolute precision. That both free hydrochloric acid and organic acids very, very often exist simultaneously, in the same chyme; that the presence of free hydrochloric acid does not negate the additional presence of organic acids, but that the presence of relatively large quantities of organic acids are abnormal and produce symptoms; that the presence of relatively large quantities of organic acids, either introduced into or formed within the stomach, gives the symptomcomplex described by me as "Organacidia Gastrica" (*N. Y. Medical Record*, September 6, 1902). That the presence of organic acids can and should be tested for by my direct method—described by me as the floating test—a test very easily carried out in about a minute or two. That

free hydrochloric acid, organic acid and the general acidity can be determined (and this has always been done by me) in one and the same specimen, thus enabling us to work with very small quantities and also to save time.

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PRECIPITINS AND THEIR MEDICOLEGAL USE.

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(Continued from Page 880.)

It was noted that among the animals tested, sheep, beef, and goat blood reacted more than the

most active serum followed the rule of affecting most prominently the heterologous bloods but proved the most satisfactory to work with since it precipitated human serum in two hours when diluted 1 in 200, far beyond the dilution where heterologous bloods gave any response whatever. Even the lower monkey bloods, Java, rhesus, baboon, failed to react with this serum diluted 1 in 100.

Next, a potent beef-rabbit serum was tested on the above specimens of blood serum with results similar to those reported by Kister and Wolff for horse-rabbit serum. This serum in dilutions of 1 in 5 caused flocculent precipitates in nearly all the bloods within three hours. In dilution of 1 in 10 (test-serum), beef, sheep, and goat blood, reacted alike. At dilution of 1 in 30 (test-serum) sheep blood failed to react, but a dilution of 1 in

TABLE II.
ACTION OF POTENT BEEF-RABBIT SERUM.

Beef		Goat		Sheep		Man		Chicken		Horse		Rabbit	
Blood dilution.. 10 50 100 200 500		10 50 100 200 500		10 50 100 200 500		10 50 100 200 500		10 50 100 200		10 50 100		10 50 100	
Time	Serum	1-5		1-10		1-15		1-30		1-50		1-50	
10 minutes.....	T T T T T	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o
30 minutes.....	F F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T
60 minutes.....	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T
2 hours.....	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F	F F F F F
3 hours.....	S S S S F	S S S S F	S S S F T	S S S F T	S S S F T	S S S F T	S S S F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T
		Serum	1-10										
10 minutes.....	T T T T T	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o
30 minutes.....	F F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T	T F F T T
60 minutes.....	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
2 hours.....	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T
3 hours.....	S S S S F	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T	T F F F T
		Serum	1-15										
10 minutes.....	T T T T T	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o
30 minutes.....	T T T T T	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o
60 minutes.....	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
2 hours.....	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T	F F F F T
3 hours.....	S S S S F	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
		Serum	1-20										
10 minutes.....	T T T T T	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o
30 minutes.....	T T T T T	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o	T T T T T	o o o o o
60 minutes.....	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
2 hours.....	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
3 hours.....	T F F F T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
		Serum	1-30										
10 minutes.....	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T
30 minutes.....	T T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T
60 minutes.....	T F F T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
2 hours.....	F F F T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
3 hours.....	F F F F T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
		Serum	1-50										
10 minutes.....	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T
30 minutes.....	T T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T	T T T T T	o T T T T
60 minutes.....	T F F T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
2 hours.....	F F F T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T
3 hours.....	F F F F T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T	T T T T T

T, turbidity; F, flocculi; S, sediment.

others, while horse, cat, rabbit, and dog bloods reacted very faintly, or not at all, and only with the earlier dilutions of the serum. The reactions with monkey blood will be considered later. The

50 (test-serum) was required before the goat blood gave no flocculi. At 1 in 100 (test-serum), the beef blood still gave a flocculent precipitate in two hours. (See Table II.)

Throughout the above series of tests, which numbered several thousand, it was rather uniformly observed that the flocculent precipitates formed most rapidly in dilutions of blood of about 1 in 100. It was frequently noted that in the tube of blood diluted 1 in 10 or 1 in 20, the turbidity failed to show any flocculent character at a time when in dilution of 1 in 100 the precipitate had fallen to the bottom, all the tubes having received the same amount of test serum. The most important factor in this result appears to be the inhibiting effect on the formation of flocculi exerted by the higher content of albumins. As the result was the same with different quantities of test serum it does not seem possible to refer it to different degrees of saturation of the precipitable molecule with precipitin, although this factor may be prominently concerned. Eisenberg refers it to a relative solubility of the precipitum in an excess of precipitable substance.

Finding that each test serum varied in its strength and specificity of action, it was thought possible that a precipitin prepared in an animal more distantly related might yield a more specific precipitin, since the scope of its cell-receptors might not include so many of those jointly shared by mammalia. Accordingly, a chicken was immunized by fifteen injections each of 10 c.c. defibrinated rabbit blood. Its serum proved very faintly hemolytic, but powerfully agglutinating for chicken blood cells, and caused precipitates in dilution 1 in 100. This serum had no effect on monkey and human blood in any dilution, but acted diffusely on the sera of several domestic animals. Another chicken received 7 injections of 10 c.c. of human placental blood. Its serum failed to affect the sera of domestic animals, or lower monkeys, in any dilution, 1 in 1 or higher, but produced an abundant flocculent precipitate in human blood 1 in 100, when added in a dilution of 1 in 50 (test-serum) in ninety minutes.

From the above experiences it seems possible to define the essential features of a specific reaction with the precipitin test. Regarding the *potency of the serum* it must be concluded that only the more active sera can safely be employed, such as cause flocculent precipitates in three hours when added in proportion of 1 of test serum to 100 of blood solution.

A potent serum is especially necessary when dealing with small blood stains. As the more potent sera are more diffuse in their action, and show certain individual variations in their effects on heterologous blood, it becomes advisable to test each serum on the blood of several domestic animals. The chicken may, provisionally, be recommended as an animal producing a more specific human precipitin than the rabbit. The *dilution of the test serum* must be high enough to rule out spurious reactions from heterologous bloods. It may safely be concluded that when test serum is added to dilute solutions of blood in the proportion of 1 of test serum to 50 of blood solution, only human and monkey bloods will give more than faint turbidities, and that a dilution of 1 in

50 is therefore a safe limit to prescribe. A dilution of 1 in 100 (test serum) may better be employed when the material to be tested is abundant, but with very small stains, yielding very weak solutions, this dilution of the test serum may fail to give a satisfactory reaction.

The *time limit* is a very important part of a specific precipitin reaction. Although Nuttall has found it advisable to measure the quantity of precipitin obtained after twenty-four hours, this lengthy period allows the access of several disturbing factors, which may be avoided by a shorter time limit; principally the growth of bacteria which commonly develop in fluids which have not been passed through a Chamberland filter. Most writers who have employed the test for medicolegal work have preferred to read the reaction at the end of three hours in the thermostat, in which time the disturbing effects of bacterial growth are not apparent, and turbidities in heterologous bloods are less prominent. Moreover, the rapidity with which flocculi form in homologous blood is a very striking distinction from the slower changes occurring in heterologous blood. Hence the objects of medicolegal work seem to require a somewhat different procedure from that best suited to the exact measurement of blood relations among animal species. The formation in three hours of a flocculent precipitate visible to the naked eye, is a requirement which effectively escapes the influence of the personal equation and is the standard now generally employed in descriptions of a specific reaction.

The question still remains as to what reliance can be placed on less definite reactions, in which the turbidity does not become flocculent in six to twelve hours, and which may often be encountered when dealing with old and altered stains. Under such circumstances, one can only conclude that the significance of the results must be determined by all the circumstances in the case, including the age and quantity of the specimen, the strength of the turbidity, and the potency of the serum, and must remain a matter of opinion on the part of the operator.

In connection with the less definite reactions one may profitably remember that humanized sera diluted at 1 in 30 rarely produce prompt and distinct turbidities in any other than human and monkey bloods, and that even in dilutions of 1 in 10 or 1 in 20 (test serum) the turbidities in heterologous bloods seldom become flocculent in three to four hours. It is in such cases that control tests are of great value to determine just what reactions can be secured with heterologous bloods by the particular serum in use.

When, therefore, one has to deal with minute or old and feebly reacting specimens, it appears to be permissible to increase the time limit to four to five hours as recommended by Strube, and to increase the strength of the test serum to 1 in 30 or 1 in 20, but with each concession of this sort the results become less certain.

While convinced that the most reliable conclusions in medicolegal work are to be obtained

by demanding, for the specific reaction, a flocculent precipitate in three to four hours, it must be admitted that the estimation of the bulk of precipitum may in some cases prove to be a necessary and trustworthy standard. In dealing with old specimens of human blood, the writers have found that the action of the serum is for some reason retarded and the precipitum is very slow in becoming flocculent, although at the end of twenty-four hours the bulk of the precipitum, as compared with the controls, leaves no doubt that the specimen is human blood. In such cases, if numerously and satisfactorily controlled, there appears to be no good reason for excluding the results obtained after twenty-four hours from those which can be regarded as specific. The controls in such cases should include a specimen of the tested fluid untreated by any serum, and one treated by some other antiserum.

The dilution of the tested fluid is a subordinate matter in the precipitin test. The writers believe that the data are sufficient to recommend a dilution of blood in the proportion of 1 in 100 as most favorable to the development of flocculent precipitates. Nuttall uses a solution of one part of blood to 20 of .6 per cent. salt in his method of estimation of the bulk of precipitum. Any accurate measurements in dissolving dried blood being impossible, we may employ Nuttall's expedient of shaking the fluid to determine if there is albumin in solution by the foam produced. Unless solutions are slightly colored reactions are very faint and flocculent precipitates cannot be expected, but blood pigments fade markedly with age. Corin obtained precipitates in solutions of blood which failed to give the spectroscopic reactions of Hb.

UNIT STRENGTH OF PRECIPITIN SERA.—It would greatly facilitate general agreement as to what constitutes a specific reaction if some means were devised of definitely determining and expressing in units the quantity of precipitin used in tests.

Von Dungern employed a rough method which can hardly be recommended. Wassermann and Schutze prepared a standard solution of blood as follows: 1 c.c. of fresh defibrinated blood was soaked up in linen cloth and dried several days or weeks. Two such specimens were then completely dissolved in 10 c.c. of .85-per-cent. salt solution, filtered, and divided into equal portions. To these were added varying proportions of precipitin serum. They designated as a normal serum one of which the addition of 1 c.c. to 5 c.c. of the above standard solution exactly sufficed to yield a distinct flocculent precipitate in one hour at 37° C. If 1 c.c. of serum sufficed it was designated as a 10 N. serum. The amount of precipitin in 1 c.c. of N. serum they designate as a precipitin unit. There are several difficulties in the way of a satisfactory general employment of this unit, including the alterations in the drying of the blood, and the probable variations in the amount of albumen secured by dissolving the stain.

It is much safer to employ fresh plasma or

serum for the standard solution, and a dilution of 1 in 100, since that strength seems to be the most favorable for the formation of flocculi, (cf. Eisenberg.) Hence the writers would suggest that a normal test serum be designated as one of which 1 c.c. added to 10 c.c. of fresh serum diluted 1 in 100 yields a distinct flocculent precipitate in one hour at 37° C. and that the unit of precipitin be the quantity contained in 1 c.c. of such normal serum. The average serum obtained after 6 to 8 injections of 10 c.c. of blood in the rabbit would then be of 10 N. strength and 1 c.c. would contain about 10 precipitin units.

ON THE DIFFERENTIATION OF MONKEY BLOOD.—Stern first noted the fact that monkey blood reacts to humanized rabbit serum much more distinctly than that of any other lower animal. He tested three species, *Cercopithecus*, *Macacus cynomolgus*, and the "Kronen-affe." Nuttall tested the blood of 46 monkeys and apes finding that the *Simiidae* yielded almost as much precipitum as man, the *Cercopithecidae* yield less, while the *Halpidae* and *Cebidae* give but little. He observed that weak humanized sera affect only the two first named groups, while a powerful serum will include them all. Nuttall and Strangeways compared the bulk of precipita forming in human and some monkey bloods with the following results. Human serum 100 per cent., *Macacus* 90 per cent., orang 80 per cent., *Cynocephalus* 70 per cent., mandrill 50 per cent., *Cercopithecus* 50 per cent. The first three monkeys named died of dysentery or intussusception and it was suggested that the manner of death might have altered the precipitable substance of the blood.

One of us has attempted the differentiation of monkey and human blood by calibrated serum, but the work is still incomplete and will be presented at another time.

Up to the present stage of this work, it has proven possible to distinguish between human and lower monkey bloods, Java *Ineues cynomolgus*, *rhesus*, *Macacus rhesus*, baboon, *Cynocephalus ursinus*, by diluting humanized serum 1 in 100, with which strength the blood sera of the above monkeys failed to yield a flocculent coagulum in three hours, and in fact gave but slight turbidity in that time. This rabbit serum, however, failed entirely to separate the blood of the chimpanzee, *Simia troglodytes*, and orang, *Simia satyrus*, which reacted as strongly as did human blood. On the other hand, a humanized chicken serum failed in any dilution, to affect the sera of the above lower monkeys, and in dilution of 1 in 100 chimpanzee blood became slightly turbid, but failed to yield a flocculent precipitate in several hours, although the human blood treated by the same diluted serum gave a flocculent precipitate in one hour. It thus appears that by careful calibration of the test serum the blood of the highest anthropoid monkeys may be distinguished from human blood. In this work it seems to be essential that the test serum be fresh and the bloods tested be fresh, or of about equal age if obtained dry or from the cadaver.

Layton has found that the blood of certain monkeys, variety not stated, may be distinguished from human blood by diluting the blood to 1 in 600, and adding the serum undiluted in the proportion of about 1 in 60.

TECHNICS.

THE PRODUCTION OF PRECIPITIN SERUM.—I.
Animals.—The rabbit is the animal generally used for the production of precipitin serum. It is easily handled, and reacts to almost every type of blood. Rabbits vary very much in their reaction to injected blood. Some produce very strong antiserum, others very weak, and still others, almost none at all. The fact that rabbits have individual idiosyncrasies in this respect has been noted by several observers. We also found that the common rabbit very often could not withstand the toxic effect of the injection and emaciated very rapidly, some of them succumbing to the treatment. Besides rabbits we used full-grown Belgian hares and crosses between them and rabbits, and they proved not only very resistant to the injections, but also yielded our most potent sera. Too much stress cannot be laid upon the care bestowed upon the animals under treatment. They are often sick from the injections, so that they require plenty of food and clean, airy quarters. It was soon found that the healthier the animals the better were the results with the sera.

Corin and Biondi, Arthus and Vansteenberg, and Hausner, used dogs in order to get larger quantities of serum and they report satisfactory results. Uhlenhuth injected a lamb and a goat with defibrinated human blood but did not obtain a good serum. One of our most potent sera was obtained from a hen which had received intraperitoneal injections of defibrinated blood. The bird gives very little evidence of any reaction to the injection, and being further removed, biologically, from man, than the rabbit, ought theoretically to yield more selective antisera. Wassermann and Schutze have been testing the serum of a goose but have not yet published their results.

II. Choice and Preparation of Material for Injection.—In order to produce an antiserum for human blood, either defibrinated human blood, blood serum, or some fluid derived from the body, and containing globulin similar to that of normal human blood serum, must be injected. Therefore exudates and transudates, such as can be obtained in the pleural sac and abdominal cavity, which contain a certain amount of serum globulin, are suitable substances for injection.

Defibrinated human blood has generally been used. We obtained it either from the umbilical cord or by squeezing the placenta. The blood from either of these sources was received into a sterile Erlenmeyer flask containing glass beads the size of small peas. If beads are not obtainable, sand, or even broken bits of glass, which have been thoroughly cleansed and sterilized, may be used. Vigorous rotation of these flasks for five minutes sufficed to defibrinate. Some investi-

gators use only the serum free from cells. While it makes little difference with the strength of the antiserum obtained, since only the serum globulin is the active agent in the process, we found it more convenient and less troublesome to use defibrinated blood rather than pure serum. Wassermann and Schutze and Nuttall use serum; Uhlenhuth uses defibrinated blood. Uhlenhuth obtains his blood fresh from the subject by means of Heurteloup's cups (a kind of wet cup). It could easily be obtained from the veins by Thacher's apparatus.

Uhlenhuth found that old dried blood dissolved in .6-per-cent. salt solution yielded an active precipitin serum. Grigorjew used dried blood, prepared as follows: 10 c.c. of either human serum or whole blood is poured on a large glass plate in a dust-free room, at ordinary temperature. The pure blood serum dries in from four to six hours, that mixed with blood in from two to four hours. To prepare this dried serum for injection, he pours 10 c.c. of physiological salt solution over the plate, scrapes the serum or blood loose and stirs it until a uniform solution is obtained.

In order to prove that the drying of the blood did not have any influence upon the formation of precipitin, Grigorjew divided into six portions 3.6 grm. dried calf's blood, three years old, dissolved each portion in 10 c.c. of 1.6-per-cent. salt solution, and injected it subcutaneously into a rabbit. The serum of the rabbit gave a precipitin reaction with calf or beef blood spots. Grigorjew's method and experiment are important because fresh human blood is not always obtainable, and in such a case, a supply of dried blood would prove of much service.

Ziemke has made use of blood from the cadaver in cases where death was due to hemorrhage. He has taken it from cadavers which were three and four days old and even older and none of his rabbits became infected. His method is to place the blood in high glass cylinders, pipette off the serum into sterile Erlenmeyer flasks and add chloroform in the proportion of one part to ten of serum. If he had doubts as to the sterility of the serum thus prepared he injected it subcutaneously rather than intraperitoneally. His results were almost, though not quite, as good as when fresh blood was used. Minovici found that cadaver blood, even when fresh, gave a weaker serum than placental blood. Minovici injected amniotic fluid and Ziemke tried hydrocele fluid. Both found that the precipitin serum obtained was weaker than that obtained with human blood or serum. The same holds true when ascitic fluids or pleural exudate are used, since as Biondi has pointed out, they contain only one-third the amount of serum globulin contained in blood. Hence larger quantities and more frequent injections are required. With pleural exudates especially it is found that the animal may not withstand the toxic substances often contained in such fluids, and the danger of infection is also greater. Albuminous urine has likewise been employed. Dieudonné used a urine which registered 3 to

7 grm. of albumin per thousand (Esbach), Le-Clainche and Vallée, a urine containing 1-2 grm.; Mertens one containing 4 per cent. albumin; and Zuelzer a 1 to 9 per cent. specimen. The animals usually suffered considerably, many injections were required at long intervals, and the resulting serum was not extremely active.

Corin has devised a method for utilizing ascitic fluid which yielded very satisfactory results. He saturates ascitic fluid with magnesium sulphate at a temperature of about 30° C. The resulting precipitate is dissolved in water and this solution again saturated with the sulphate. This precipitate is then allowed to dry on the filter. For injection, it is only necessary to dissolve the dried precipitate in water, as the magnesium sulphate is not harmful to the animal. Corin estimates that the solution thus obtained contains 4.5 per cent. paraglobulin. By this method a concentrated solution of globulin can be injected at frequent intervals. Ammonium sulphate cannot be used because it throws down albumin as well as paraglobulin; because the precipitate does not dissolve easily in water; and the solution when obtained is found to cause a cloudiness in human serum through the action of the salt.

In the present work it was found that either fresh serum or defibrinated blood yielded the best results. Our results with other albuminous fluids were unsatisfactory, and we do not believe that any other material can safely replace fresh whole blood, when medicolegal work is proposed and active selective sera are required. Most of the human blood was obtained from the cord and generally remained sterile. The quantity obtained at one time was necessarily small, amounting on the average to two ounces. By squeezing the placenta, larger quantities of blood can be obtained, but there is more likelihood of contamination. Another factor, which seems to have some bearing on the production of a potent serum, was the freshness of the blood. The reaction of the rabbit after injection of a fresh specimen was always more pronounced and more lasting than from specimens which had been kept in the refrigerator a few days. Uhlenhuth and Minovici noted this same fact. Beef, sheep and other bloods obtained from the slaughter-house should be tested bacteriologically before using, since they are frequently contaminated with vomitus.

III. Methods of Injection.—The injection may be either subcutaneous, intraperitoneal or intravenous. Each method has its adherents, and produces an equally good antiserum when the other conditions are equal. Uhlenhuth, Biondi, Corin, Nuttall and Minovici, injected intraperitoneally. Grigorjew, Dieudonné, Arthus and Vansteenbergh, Okamoto, Stern, and Wassermann and Schutze, injected subcutaneously. Graham-Smith and Sanger, LeClainche et Vallée, Mertens, and Strube, prefer intravenous injections. The technic of subcutaneous and intravenous injections, requires no special comment. The method of intraperitoneal injection is more com-

plex and requires greater care. The method employed by Minovici is as follows: Animal held head downward, in order to get the internal organs out of the way, hair cut away with scissors from lower part of abdomen and skin sterilized with 2-per-cent. sublimate solution; epidermis cut with sterile scissors, and needle pushed through the wound into the abdominal cavity; wound closed with cotton and collodion. He injected twenty rabbits by this method and had no infection.

Nuttall shaves the abdomen, sterilizes the skin with lysol, and punctures the skin in the lower left hand region of the abdomen with a scalpel. Then he bores through the fascia and the muscles with a blunted hypodermic needle and afterward applies tr. benzoin to the cut.

Biondi draws up the blood or serum into a long sterile glass tube which has been drawn out to a point at one end. The other end is closed with sterile cotton. He disinfects the skin of the abdomen with 10 per cent. sublimate and then bores through into the peritoneal cavity with the capillary end of the tube.

The method we employ is as follows: An area about the size of a half dollar, just below the middle of the abdomen, is shaved and disinfected either with lysol or sublimate solution. An assistant holds the rabbit by the ears with one hand and places the other behind the animal's shoulders keeping the head stretched well backward. In this way the greater part of the body hangs free, and the skin of the abdomen is tense. The needle is then inserted at any point in the part prepared. It should be inserted through skin and muscle slowly and with steady pressure and as soon as it enters the peritoneal cavity, which it does with a jerk due to the absence of resistance, it should be turned in such a manner as to be along, and close to, the peritoneum covering the abdominal wall it has just entered. The needle may then safely be inserted a sufficient distance to ensure its remaining in the body while the blood is injected. The object of turning the needle as soon as it is through the peritoneum is to avoid puncture of the gut which is the only danger in the method. By practice one soon learns to feel the jerk which signals the entrance into the body cavity. If the needle is sharp and is inserted slowly and with even pressure the rabbit will remain perfectly quiet when held as directed. Should the rabbit be refractory, it will be necessary to hold the hind legs extended. In so doing the animal's back should be arched so as to cause the abdomen to bulge. The object of this is to prevent the needle merely passing through the skin and subcutaneous fascia and pushing the muscle wall in front of it, so that a subcutaneous injection results instead of an intraperitoneal. The needle should be of fairly large caliber, a hypodermic is too small, and should have a length of at least two inches. If the needle is so large that it leaves a canal through which the blood oozes from the peritoneal cavity, a valve can be made to close it by first drawing the skin to one side and puncturing, after

which it is allowed to retract into place and thus cover the hole through the fascia and muscle wall. After puncture, no collodion or other dressing is necessary.

IV. Number and Frequency of Injections.—

The number and frequency of injections required depends on which route is employed, intraperitoneal, subcutaneous or intravenous. Strube states that on an average six intravenous injections of 1 c.c. of defibrinated blood given in the course of eight days, produce a serum yielding a positive reaction in human serum diluted 1 in 1,000. He admits that much depends upon the individual peculiarities of the rabbits. In one instance he obtained a serum which gave a reaction in 1 in 20,000 after injections covering a period of fourteen days. He does not state how much or what blood or how many injections he used. Mertens at first injected subcutaneously and then changed to the intravenous method. He injected urine containing albumin every day for seven days to the amount of 35 c.c. LeClainche and Vallée also injected urine intravenously, 20 c.c. at a time, and a total of 150 to 200 c.c.

The latest investigators using the intravenous method are Graham-Smith and Sanger. They injected about 18 c.c. divided into portions of 5, 5, 5, and 3 c.c. at intervals of two, three, and four days. They found this to be sufficient to produce a powerful antihuman serum. Powerful antibeef and antisheep sera were obtained after the intravenous injection of 9 and 12 c.c., in doses of 1, 2, 1, 3, and 2 c.c. and 1, 5, 2, and 2 c.c. or 3, 5 and 3 c.c., respectively. The intervals between the injections were 4, 4, 2 and 5 days in each case. We are in no position to criticise this method, having used only the intraperitoneal route, but suggest that more uniformity is desirable. Some investigators, among whom is Uhlenhuth, report poor results with the intravenous method, and prefer one of the other means. It is also difficult to form any idea of the strength of the sera thus obtained, because the descriptions of the reactions are incomplete.

Wassermann and Schutze are the most prominent investigators to use subcutaneous injections. They obtained their sera by five or six injections of 8 to 10 c.c. of serum, every second day. This they claim gives a serum which is powerful enough to differentiate human blood. Grigorjew and Dieudonné injected 10 c.c. subcutaneously every third or fourth day, and used six injections. Arthus and Vansteenbergh employed five injections of 5 c.c. each, every fifth day.

Stern injects 5 to 10 c.c. beneath the skin at intervals of two days or more, depending upon the condition of the animal. Okamoto also used the subcutaneous method. He injected amounts of blood varying from 12 to 15 c.c. at irregular intervals, which he determined by fluctuation in the rabbit's weight. Total quantity injected was from 60 to 85 c.c.

The intraperitoneal injection, which is the method generally used, is employed by Uhlenhuth. He injects 10 to 20 c.c. at intervals of six

to eight days, until he has injected a total of 60 to 80 c.c. Ziemke injects every third to fourth day, depending upon the behavior of the animal's weight, until the total of 60 to 100 c.c. is reached. Minovici used six to eight injections of 10 c.c. each, of fresh blood, every fifth or sixth day; older blood every second day. Honl injects 5 to 10 c.c. every third or fourth day. Nuttall, whose work in this field covers the most ground, injects intraperitoneally, five or six times. He commences with 5 c.c., and then, after the third injection, increases the quantity to 10 c.c. He regulates the interval between injections by waiting until the animal regains the weight lost after a previous injection. Biondi injects intraperitoneally 5 to 10 c.c., at intervals of two to four days, until the rabbit has received from 50 to 80 c.c. He obtained his best serum from the rabbit which had received 40 c.c. within 24 days.

Our experience has led us to prefer the intraperitoneal injection, because of the ease of execution, the small chance of infection when a little care is exercised, the fact that rabbits react promptly when foreign matter is introduced into the peritoneal cavity, and because the peritoneum is tolerant to such injections. We have found that the most suitable amount for the single injection of human defibrinated blood or serum is, as a rule, 10 c.c. If the blood or serum is fresh, it is safer to inject at first only 5 c.c. This is especially true of the serum of certain horned animals, as beef, and sheep, which are more toxic to the rabbit than human blood. We have injected as high as 20 and 30 c.c. of serum at one time, but these large quantities did not increase the potency of the serum. On the contrary, they seemed to inhibit the formation of antibodies.

We found that injections at an interval of four days, yielded the best results. Some observers use the weight of the animal as a guide to the repetition of the injection. We did not find it necessary to resort to this measure, because one sees at a glance whether or not the rabbit is doing well, if it feeds normally and is as active as it should be. Those who observe the weight of the injected rabbits also find that a three or four day interval is the most suitable. If the blood is old or if the rabbit is very tolerant, injections may be made as often as every two days. But not much time is gained in such cases, since it would appear that the animal requires a larger number of injections to develop a powerful anti-serum. When a rabbit does not appear to be doing well, treatment should be omitted, until it has recovered. Nothing is gained by injection at such a time, because it is almost certain to cause further emaciation and is just as certain not to cause the formation of a good antiserum. The number of injections required we found to vary, according to the material used and the idiosyncrasy of the rabbit, from five to eight; the total quantity of serum being from 50 to 80 c.c. This experience accords with the observations of Uhlenhuth, Wassermann and Schutze, Biondi, Nuttall and others. We found that if after eight in-

jections, a satisfactory serum was not obtained, further treatment was useless, as the animal was apparently incapable of yielding a good serum. On one occasion Schutze, in this laboratory, obtained a very active precipitin after two injections of a total of 20 c.c. of defibrinated blood. With subsequent injections to the total number of seven, there was no improvement, in fact the serum became weaker. Nuttall noticed that some rabbits yielded a good serum after the third injection. If injections are continued after an animal has developed an active antiserum, the strength of the serum may be increased, but sometimes it is diminished, as observed by Uhlenhuth and ourselves. In one instance an animal giving a serum which yielded flocculent precipitates in one hour when added to human blood (1 in 100) in dilution of 1 in 200, received two injections in four days of 20 to 30 c.c. of fresh blood. One week later its serum diluted 1 in 50, failed to precipitate human blood 1 in 100 in three hours. At the same time the animal began to emaciate. Stern was able by repeated injections and with due regard to the condition of the rabbits, to produce an antiserum which reacted in blood 1 : 50,000.

It sometimes happens that after a rabbit has received eight injections, it yields an antiserum which is not as powerful as desired. If, now, this rabbit receives no further treatment for at least one month and then injections are renewed, the potency of the precipitin may be found to have increased. One of our antipestilence rabbits did not yield a good antiserum after several large injections. It had not lost appreciably in general condition. Nothing further was done to the rabbit for three weeks, when the injections were resumed. It then yielded a much more powerful antiserum than before. Strube reports that one rabbit, which had received 8 c.c. of blood intraperitoneally in January and had a value of 1 : 5,000, was reinjected in April, with the same quantity of blood, and gave a reaction in 1 : 20,000 dilution of human blood.

Uhlenhuth first called attention to the fact that some sera from immune rabbits have a milky, opalescent appearance. He noticed that this opalescence increased after intravenous injections. Physiologists ascribe its occurrence to digestion. Nuttall noticed it and thinks it due to very large injections. He also remarked that some of the rabbits yielding this serum suffered from cysterceri of the liver. Uhlenhuth and Rostocki have shown that it cannot be removed by filtration through porcelain. We noticed it in one case which had received large injections. Such sera are untrustworthy and should not be used.

The course of the development of blood precipitins has been followed by v. Dungern who describes four periods: (1) a latent period following the injection, during which the blood fails to show any precipitin, (2) a period of increase of precipitin, (3) a period of equilibrium, when the precipitin does not vary, and (4) a period of decrease of precipitin. In fresh animals a period of four to six days followed the first subcutaneous

injection of foreign plasma before any precipitin appeared in the blood. The precipitin then increased in quantity reaching its highest development in about two days. A short period of equilibrium then followed or the decrease began at once and continued irregularly, with considerable variations in different animals. If a new injection is given, at the time when the precipitin has reached its highest point, within one-half hour most of the antibody disappears, being saturated by the new plasma, and the latent period before the reappearance of precipitin is shorter than after the first injection and continues to shorten after succeeding injections. After successive injections the increase of precipitin is usually much greater than after single doses and persists longer. Five minutes after single injections the foreign albumin was demonstrable in the blood by the precipitin test, but disappeared within one hour. After successive injections the disappearance of the foreign albumin was slower.

V. Methods of Bleeding.—The progress of development of precipitin in the blood, may be determined from time to time by drawing a little blood from the lateral ear vein of the rabbit. These preliminary tests of the serum should not be made less than three or four days after an injection, since each injection of blood causes a temporary diminution in the precipitin. The ear is shaved, sterilized with lysol, sublimate or other disinfectant, and washed with sterile water. It is well to suspend the rabbit by the hind legs, and to have an assistant gently compress the vein at the base of the ear. When the vein is cleanly cut the blood flows to the tip of the ear and can be caught so that it drops to the bottom of the test-tube. When there is about 5 c.c. in the test-tube it is laid in a slanting position, permitted to clot, and then placed in an ice chest. If it is found that the serum does not exude from the clot, the latter should be loosened from the test-tube by means of a platinum loop. The serum will also be found to collect better when the tube is out of the ice chest for a time.

There are three practical methods of obtaining large quantities of serum from the rabbit. The first is by bleeding from the ear veins. We have already described the procedure. As much as 40 c.c. of blood may be had at a single bleeding and if care is exercised the blood obtained can be kept sterile.

Wadsworth (1903) demonstrated, before the New York Pathological Society, a method whereby the blood is made to flow profusely from the lateral ear vein. The rabbit is held head-downward and wrapped in a blanket. Inside the blanket and next to the spine is placed a hot water bag with the result that the peripheral vessels are dilated by overheating. The second method of bleeding the rabbit is one which entails the death of the animal, and consists in bleeding from the heart. As practised by Uhlenhuth, the procedure is as follows: The hair is removed from the chest-wall, the skin sterilized, and the anterior chest-wall cut away with sterile scissors. The

left ventricle is then cut and the blood allowed to flow into the pleural cavity, whence it is sucked up with a sterile pipette, put into flat dishes or cylinders, allowed to clot, and the serum removed later. Minovici modifies this method in that the pulsating heart is lifted out of the chest and held in the mouth of a vessel into which the blood flows when the ventricle is cut. The third method is that of bleeding from the carotid artery. It is frequently used, because a large quantity of blood is obtained without sacrificing the animal. The rabbit is fastened securely on its back, the head well extended and the throat shaved. The skin is then disinfected and an incision is made in the median line, extending from above the larynx to the sternum, and through the skin and fascia. Then by means of blunt dissection the muscles along the trachea are separated and the carotid exposed. The vessel must be freed from the pneumogastric nerve, which lies in the same sheath with it and in doing this care must be exercised to avoid tearing the vessel. When the carotid is isolated it is clamped as high up as the incision will allow and also as low down as possible. The vessel is then divided near the upper clamp and seized securely by its fascia, with small pointed forceps near the cut end. The lower clamp is then loosened and the stream of blood can be directed into the receiving vessel or into test tubes which are afterward laid in a slanting position. When a test tube contains enough blood the artery clamp can be temporarily closed until the next is ready. Sometimes a clot forms at the mouth of the vessel and stops the bleeding. This is easily removed by stripping the vessel with a pair of anatomical forceps. When sufficient blood is obtained, both ends of the carotid are tied off and the wound sewed. If it is desired to exsanguinate the animal, it will be found advantageous toward the end to firmly compress the body with the hand, commencing at the lower end of the abdomen and ending at the chest. In this way almost every drop of blood can be squeezed out of the body. Some investigators insert small glass tubes into the carotid but this is unnecessary and complicates the operation.

In bleeding a bird the blood is taken from the large vein on the under surface of the wing, which is plainly seen beneath the skin at the angle between the wing and trunk. It bleeds very freely.

A considerable interval should elapse after the last injection, before the blood is removed for use in tests. From experiments conducted principally on the development of bacterial precipitins, it has been found that the greatest development of immune bodies is seen from one to two weeks after the last of a series of injections, and the same rule has been found to apply in the development of blood precipitins. Some observers regard six days as sufficient, while others allow fourteen. We have always obtained active sera after an interval of seven to ten days.

There are at hand but few definite observations regarding the *persistence of active precipitins* in

the blood of animals employed. Strube found in eight rabbits which had been treated intravenously that the sera retained a value of 1 in 1,000 for four weeks. Later they diminished rapidly in strength, for after eight weeks three animals which showed original strengths of 1 in 5,000, 1 in 1,000, and 1 in 1,000, had almost completely lost their activity. Graham-Smith and Sanger found that some sera retained their specific qualities for twelve months, while others deteriorated more rapidly. Nuttall noted that some sera became untrustworthy after a time, giving cloudings with all sera.

Our chicken immunized to human blood, and whose serum originally gave a flocculent precipitate in one-half hour in human serum 1 in 100, when added in dilution of 1 in 50, very rapidly lost its potency and was practically inert four weeks after the last injection.

Of two humanized rabbits receiving nine injections and then yielding a serum which at dilution 1 in 30 gave a flocculent precipitate in one hour, we found that one continued to yield a powerful serum for at least twenty-three days (flocculent precipitate at 1 in 30 in one hour) but the other had lost much of its activity in that time (moderate turbidity at 1 in 30 in three hours). A beef rabbit, also, after twenty-eight days, gave a serum of undiminished activity, while a humanized rabbit strongly immunized but emaciating from ringworm, gave an inert serum after eight months. Comparing these observations with those on the changes in serum stored on ice, it appears that the specific precipitins are much longer retained in the test tube than in the animal's body, but that a strongly immune animal may be expected to yield a good serum for at least three weeks after the last injection.

METHODS OF APPLYING THE PRECIPITIN TEST.—Many of the details of the application of the precipitin test have been fully considered in the theoretical discussions of this article. Other matters which deserve mention, concern the methods of dissolving the suspected stain, its clarification, the instruments to be used, and the scope of necessary controls. The solution of the stain should be made in .6 or .8 per cent. of NaCl (c. p.). A fresh stain dissolves promptly, but very old stains may require soaking for some hours. Ziemke has recommended .1 per cent. soda solution as more active than salt in dissolving old stains, and he reports some positive results obtained from such solutions when the solution in salt was negative. That some of the reactions were referable to the soda and not to a specific reaction on the albumins is suggested by the observations of Graham-Smith and Sanger, who obtained some spontaneous precipitates when blood serum was dissolved in .1 per cent. caustic soda. The use of this solvent cannot at present be endorsed. Ziemke also claims to have secured positive results from stains entirely insoluble in salt or soda by dissolving in concentrated solution of potassium cyanide and neutralizing by tartaric acid in substance almost but not quite to the point

of neutralization to litmus. This procedure also introduces sources of error that are difficult to control, especially the abnormal content in chemicals. Graham-Smith and Sanger found that test serum is clouded in one hour by potassium cyanide 1 per cent., or tartaric acid 1 in 1,000, although the prompt neutralization of the acid prevented any precipitation of albumins. We have employed this method successfully, with proper controls, on comparatively fresh blood clots, but failed with an old specimen of blood in earth. It can be undertaken only with comparatively large stains. Schutze, in this laboratory, could not convince himself that the results with this solvent were trustworthy.

All solutions of blood stains from miscellaneous materials should be tested for their reaction to litmus, and if found distinctly acid or alkaline, should be neutralized by sodium carbonate or tartaric acid. If spontaneous or spurious reactions occur in solutions of blood from earths containing lime salts, these must be removed by a current of CO_2 , and filtered (Graham-Smith and Sanger).

There appears to be at hand no means of removing from solutions of stains on leather the tannin which seems to be the cause of spontaneous and spurious reactions. The general topic of the removal from solutions of blood stains these and other disturbing agents which will doubtless be encountered from time to time offers a large field for further investigation.

Great care is necessary in the choice of chemicals used in serum work. The writers encountered a sample of NaCl guaranteed c. p., which caused spontaneous precipitates in various sera.

Filtration.—Most solutions of blood stains require filtration, since it is essential that the fluids be perfectly clear before adding the test serum. Filtration through Schleicher's paper (blue label) will clarify the great majority of solutions.

An asbestos wool filter backed by a perforated platinum scale is also very effective. An electric centrifuge is of much value as a means of clarifying many solutions.

Solutions of materials containing many bacteria should be passed through a small Berkefeld or Chamberland filter. Small test tubes, inside diameter not less than one-half centimeter, are required, and a stock of sterilized pipettes are needed to handle the solutions and test serum.

Greenbaum and others, instead of using test tubes, have followed the reaction under the microscope in specimens prepared by adding one or more drops of test serum to a small quantity of solution on a glass slide or in a hanging drop. The use of alkali is in the cleansing of glass ware must be avoided.

Controls.—Without the employment of several controls, no reliable conclusions can be obtained from the application of the precipitin test.

The frequent occurrence of spontaneous precipitates demands that one specimen of the tested solution be carried through without the addition of any serum.

Since the solution may contain some agent slowly precipitating foreign albumins, it is necessary to carry through a specimen of the tested solution which receives the same quantity of some other antiserum or foreign serum as is used of the specific test serum. In testing for human blood the writers employed for this control a potent beef-rabbit serum, but normal rabbit serum may perhaps suffice.

Very welcome corroborative evidence is usually obtained when one carries through a known specimen of human blood of appropriate dilution to which is added the usual quantity of test serum.

As there is considerable variation in the specificity of different rabbit sera, careful workers prefer to test each serum on the blood of several domestic animals as well as on human blood, to determine not only the strength of the serum, but also its effect on heterologous blood. This control is the more necessary with the more powerful sera.

If the observation extends longer than three hours, the precipitum should be examined for the presence of bacteria, the growth of which is not always inhibited by chloroform.

Since any albumin from the human body may respond to humanized antiserum, it must first be determined by the hemin or spectroscopic tests that the material is blood. While it is possible that the blood of a domestic animal may be mixed with human albuminous exudates as sputum, pus, urine, or feces, such a combination must be exceedingly rare. A microscopical examination will usually determine the presence of mucus in sputum, excess of leucocytes in pus, and fecal detritus. The gross appearance of the stain will usually determine the possibility of mixture with urine, or the demonstration of characteristic crystals of nitrate of urea may be undertaken.

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MEDICAL PROGRESS.

MEDICINE.

Protection Secured by Antityphoid Inoculation.—This report refers to the incidence of typhoid fever in the inoculated and uninoculated soldiers in Lord Methuen's column at the Modder River, South Africa, from December, 1899, to March, 1900. A. E. WRIGHT (*Lancet*, Oct. 10, 1903) compares these records with those obtained from a similar investigation made in India during the year 1901. The report shows that the more recent experiments testify to a diminution of the incidence rate by more than half during the period of observation. In South Africa it is fair to believe that the continuance of a similarly diminishing rate has persisted. Unfortunately the records do not state anything in regard to the case mortality of the inoculated and uninoculated, who are attacked by typhoid. This, no doubt, is due to the fact that the sick were transferred out of the Surgeon-General's jurisdiction.

Notes on the Urine of Children.—Although Dr. Churchill, of the Chicago Polyclinic has presented some interesting conclusions on this subject, it appears that variations in race and climate make it necessary for each community to work out what might be called the "iso-ures" for its own particular region. ARTHUR W. FULLER (*Lancet*, Oct. 10, 1903) has endeavored first to estimate the average amount of urine passed in twenty-four hours by children of average health of the ages of six months up to twelve years, inclusive. Secondly, the estimation of the total urea usually passed in the urine of children when in health. Thirdly, the quantitative estimation of the purine bodies in the urine of such children. The method of estimating the total urine passed was as follows: Each child was obliged to empty its bladder at noon,

and the child was then carefully weighed. All the urine passed until noon the next day was saved, and a mixed specimen used for determination. The purine bodies, although containing but a small quantity of nitrogen, almost all of this element passing off in the urea, are of great interest from the point of view of protein metabolism and the estimation of uric acid. They used to be called the xanthin on nuclein basis, but more recently they have been shown to be derivatives of a substance called purine. Theobromine, caffeine, theine, substances which are present in quantities varying from one to three per cent. in cocoa, coffee and tea, are also purine derivatives. Purine itself, however, has not yet been found in the body. The quantity of purine bodies in the urine bears a distinct relation to the amount of the purine contained in the food eaten, and is also affected by the extent of the nuclein cleavage in the metabolic processes of the body. Thus have arisen the terms oxogenous and endogenous purines. Purines exist in all forms of meat extracts and in fresh meats. All vegetables contain them. Oats also contain them. The specific action of uric acid and the other purine bodies upon the various tissues of the body are of great interest, first in relation to the question of diet in children during the early years of life, and second, in regard to the cessation of the process of growth, the maintenance of adult life and the gradual decline of body activities. The general conclusions are as follows: The amount of urine increases with the growth of the body, but the amount of urine passed per kilogram of body-weight does not increase. The amount of urea passed per kilogram of body-weight would appear to be increased about the second year, but after that it is constant up to the twelfth year, the increase at the second year being due to the greater quantity and variety of food. The purines bear no relation to the kilogram of body-weight. This is of interest because, as there were great variations in the individual, it may point to hereditary and constitutional tendencies. A recognition of which might enable one to prevent gouty or kindred attacks.

Tuberculous Rheumatism.—Under this name are to be included, according to A. PONCET and M. MAILLAND (*Monographies Cliniques*, Aug. 1, 1903), a series of manifestations, apparently rheumatic and of tuberculous origin, residing either in the articulations (articular tuberculous rheumatism) or in other organs, as tendinous sheaths, muscles, nerves or viscera (abarticulate tuberculous rheumatism). Whether these conditions are single or associated, their lesions are most frequently distinct from the habitual lesions of tuberculosis. Their manifestations range all the way from hyperemia and exudation to acute or chronic inflammation, without specific products. Tuberculous rheumatism belongs to the large class of infectious rheumatisms, or pseudo-rheumatisms. Another fact that imparts to this condition the distinction of being a new pathological entity, is the surgical experience that these cases have none of the tuberculous lesions in the classic sense of that word. They are exclusively inflammatory lesions, in no way distinguishable from those produced by other infections.

Rapid Method of Diagnosis in Leprosy.—With this disease hovering about so constantly, although sparsely, it is of value to the general practitioner to know that it can easily be diagnosed by a physical examination of the peripheral nerve-trunks. Of these a most characteristic symptom is the swelling which is in some cases very marked. The ulnar, being the most superficial, is the one in which enlargement is easily detected, notwithstanding the external popliteal, as it winds around the neck of the fibula and the musculo-spiral, where it becomes superficial, above the outer condyle, are almost equally prominent. Dr. F. J.

SHEPHERD, of Montreal (Jour. of Cut. Dis., Oct., 1903) reports a case in which the diagnosis was obscure, and in which this symptom lent aid in establishing it. The patient was a Chinaman from whom history was not to be had. There was no nasal secretion whatever, so that the point in diagnosis first noted by Dr. Mewborn, viz., that the lepra bacilli are always to be found in the nasal secretion—leading to the belief that the nose may be the original method of ingress—was absent because of the lack of secretion. A nodule was therefore cut from the thickened ulnar nerve and on microscopical examination the whole tissue of the nerve was found to be packed with the germs.

Etiology of Exophthalmos.—The most common causes of protrusion of the eyeballs are trauma and suppuration of the orbits, periostitis, thrombosis of the ophthalmic vein or of the sinus, less commonly hemorrhage, emphysema or tumors of the orbit. Two distinct diseases are characterized by this symptom, Base-dow's disease and pulsating exophthalmos. In high-graded myopia and complete external ophthalmoplegia there may also be an undue prominence of the bulbus. It is less commonly known that cerebral disease (tumor, abscess, external and internal hydrocephalus and chronic serous meningitis) leading to increased intracranial pressure, is frequently accompanied by exophthalmos, and G. FLATAU (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 5 and 6) cites five cases of his own observation. Probably if all cases were to be examined systematically with the exophthalmometer before and after lumbar puncture, the symptom would be encountered more often. Rarely it may be due to irritation of the sympathetic; in most instances it is an expression of impeded circulation in the cavernous sinus. As a rule the tumor or abscess will press directly upon the sinus, though in rare cases the general intracranial pressure may be so extreme as to interfere by itself with the circulation. Compression of the sinus in the posterior fossa will also bring about stasis in the cavernosi. Individual variations are present and sometimes the anastomoses with the facial vein are so abundant that the entire cavernous sinus may be compressed without the appearance of exophthalmos. In such cases, however, there is generally edema of the lids.

Pathogenesis and Treatment of Goiter.—The hypothesis is advanced by G. MIGLIACCI (Gazz. Osped., Sept. 27, 1903) that goiter is due to the presence, in drinking water, of a specific organism; and that some special condition of the gland, in individual cases, renders it a fitting soil for the development of the micro-organism. This hypothesis he bases upon the following facts: Goiters are common under conditions which cause stagnation of blood in the thyroid vessels; as in those countries in which heavy loads are carried upon the back and held in place by straps which are so arranged as to compress the vessels of the neck. These tumors sometimes occur after a sudden, violent muscular effort, and finally, epidemics of goiter are seen in countries in which it is endemic, and in the water of one such a locality—Aosta—Carle and Lustig found a microorganism of special morphological and biological characteristics. Microscopically, the tumor is seen to be largely made up of new-formed connective tissue, which compresses and causes atrophy of the healthy tissue. This connective-tissue formation the author believes to be due to irritation from the bacterial toxines; Torri having demonstrated that chronic infections induce connective-tissue proliferation in the thyroid. Administration of thyroid preparations seems in many instances to have best fulfilled the indications for treatment, i.e., supplementing the lessened functional power, due to compression—atrophy and destruction or limitation of the connective tissue. That the latter is accom-

plished, is evidenced by numerous cases in which the size of the gland was much reduced, or its increase arrested by administration of thyroid preparations. How this is accomplished is not clear, but the author suggests that it may be due to a bactericidal power of the thyroid juice.

SURGERY.

A New Cystotomy Operation.—A novel procedure, particularly applicable to old people with thick abdominal walls in whom a median cystotomy would be attended with considerable risk on account of possible complications, is recommended by R. FRANK (Archiv f. klin. Chir., Vol. 71, No. 2). The operation is practically a perineal cystotomy and the main points are as follows: A transverse perineal incision is made and the rectum separated from the prostate, the blunt dissection being carried back until the posterior bladder wall, the seminal vesicles and Douglas' pouch are exposed. The section of exposed bladder wall is now incised in the median line, and the interior of the viscus explored. The author has used this method in two cases of vesical calculus, and in one of papilloma of the bladder, with good results. The operation requires more skilled technic than the median section, but the author thinks that this is compensated by the simplicity of the after-treatment, more favorable drainage and cutting short the period of healing. The patients need to be kept in bed about eight to ten days, but during this time they may change their position and from the beginning lie on their side.

Surgical Access to the Spleen.—In case of a floating spleen, a median laparotomy must be resorted to in operating upon that organ, as its location is uncertain; but if its position be fixed, it is best reached by extra-pleural resection of the left costal arch, according to J. VANVERTS (Nord. Méd., Sept. 15, 1903); the severance of the ribs' anterior attachments, one to the other permitting them to be spread apart and more readily raised, so that a wider access to the operative field is obtained. The author describes the operation as follows: In the presence of a hypertrophied spleen, a median or lateral longitudinal abdominal incision is made; this being met by a transverse incision, the posterior limit of which reaches the midaxillary line. If the spleen be of normal size, the incision is made parallel with the costal arch and about a finger's breadth below it. This incision commences at a point midway between the median and mammary lines, and extends to the mid-axillary. The ribs are laid bare by dissection of the flap, the ninth and tenth resected at their chondrocostal articulations and the eighth one centimeter from its chondrocostal articulation, and again at a point corresponding with the internal limit of the incision. The cartilaginous bridge between the seventh and eighth ribs is then severed. The arch being liberated, with a bistoury, from the insertions of the diaphragm, it may be readily raised, thus affording a very free access to the spleen.

A New Instrument for the Introduction of Wire into Aneurisms.—The factors in the construction of an instrument for this purpose are: (1) It must carry the wire on a reel and have some form of fine canula through which the wire is to pass; (2) it must remove the wire from the reel and force it through the canula, yet without permitting it to kink; (3) it must not allow the wire to damage the sac or the surrounding tissues, although some force has to be used in the introduction of the wire, in other words, it must be made to coil up within the sac; (4) it must be simple in construction and so easy to work that no instrumental complication may occur during the actual operation, and it must necessarily be capable of withstanding prolonged boiling; (5) it should, if possible, "snag" or roughen the wire,

as coagulation is likely to be promoted by such roughening. D'ARCY POWER (*Lancet*, Sept. 19, 1903) describes such an instrument, which has been perfected by Mr. G. H. Colt. Eighty inches of silver wire, with a clotting surface of 37 square inches were introduced, with the aid of this new machine, with such speed that the entire operation occupied but 30 minutes. The aneurism was from the abdominal aorta and sacculated. Unfortunately the patient died, but the autopsy showed that so far as the technic of the operation went, the result of the machine's work had been very satisfactory. A few strands, seven inches long, were found projecting into the aorta, having reached this position via the lumen of communication; otherwise the wire was evenly arranged over the periphery of the aneurism. The wire used was No. 27 Standard Wire Gauze. It was slightly flattened by being passed under a milling tool. The instrument is made by Down Bros.

Adrenalin for Anesthesia.—The two things which must constantly be kept in mind in using adrenalin with cocaine, are the proper dose and the possibility of a secondary hemorrhage, according to H. BRAUN (Centralbl. f. Chirurgie, Sept. 19, 1903). Eight drops of the commercial solution have caused very disagreeable symptoms and even respiratory failure in one case. The addition of two to five drops to 100 c.c. (3½ oz.) of Schleich's solution will, in most cases, be sufficient. So dilute a solution has another advantage: It will check capillary hemorrhage without constricting the larger vessels, so that ligatures can be applied and secondary hemorrhage need not be feared.

Iodipin Injections Demonstrated by the Roentgen Rays.—An interesting observation, made by M. LANDOW (*Münch. med. Woch.*, Sept. 22, 1903), is that iodipin injected into tissues can well be demonstrated by the X-rays, even if several months have elapsed. That a wrong diagnosis can easily be made is clear. The author's patient was suffering from bone-abscess, which had been treated for a long time as rheumatism with iodipin. The radiograph showed dark streaks in the muscles, which were first looked upon as evidences of ossifying myositis. At the operation they proved to be areas infiltrated with oil, which gave a distinct iodine reaction and a dark shadow when tested with the X-rays.

Aneurism of Left Subclavian Produced by Fracture of Clavicle.—A subclavian aneurism is rare enough to of itself be of interest. When it is the result of a fracture of the clavicle it becomes at once a condition of exceeding rarity. A patient, seen by W.M. TAYLOR (*Dublin Jour. of Med. Sciences*, Sept. 1, 1903), was quite healthy previous to a fall on his left shoulder. There was no history of syphilis. After the fall his fractured collar-bone was treated for two weeks, when he came into the hospital and the pulsating tumor was noticed. The tumor was most prominent just at the site of fracture, and occupied the lower part of the left posterior triangle of the neck, extending forward underneath the sternomastoid and overlapping the broken fragments. There was pain, tingling and numbness in arm and hand, and a radial pulse much smaller than on the other side. A radiograph showed a spicule of bone projecting inward at right angles, and presumably the cause of the aneurism. In the upright position the tumor no longer seemed to pulsate, but in recumbency the pulsation was marked. In a difficult operation the artery was seized, the sac opened, the clots turned out, and a small opening the size of a large knitting needle found in the third segment of the artery. Three pairs of forceps were applied, one external, one internal and one just over the opening. Gauze was packed in to steady the forceps, and the arm supported on pillows and wrapped in wool. On the twelfth day the forceps

were removed, and the patient, aged sixty-two years, is now quite well, free from pain, and has complete sensation in arm and hand. Power is gradually returning.

Rupture of the Cicatrix after Laparotomy.—Orloff has, some time ago, collected reports of 26 cases of rupture of the cicatrix after laparotomy, and to these A. N. ZEEMIN (*Roussky Vrach.*, Sept. 20, 1903) adds two. One was a case of gastro-enterostomy for cancer of the pylorus. The abdominal wall was closed with silk sutures. Vomiting after the operation continued for over a week. Patient was fed with nutritive enemata. Sutures were removed on the ninth day. The next evening he began to feel pain in the wound after a slight attack of coughing, and by the next day the edges of the wound were distinctly separated. A double row of stitches was introduced, as well as a tampon, and notwithstanding several attacks of vomiting, the wound healed kindly, and a firm, strong cicatrix was formed. In the second case, that of a supposed gumma of the stomach, a similar operation was performed, but the wound opened in its upper part; a tampon was inserted, but fell out; hiccup followed, and a considerable protrusion of intestine was observed. This was carefully replaced, and the wound closed again. The stitches, however, cut through, and a granulating surface was formed. Recovery was slow and unsatisfactory. It would be difficult to determine the causes of such ruptures, as the wounds, in all the 28 cases, were closed in a great variety of ways, and many materials were used in closing them. Thus some operators superimposed the sutures at once over all the layers of the abdominal wall, others resorted to double sutures; some used catgut, others silk, silkworm-gut, or silver suture; others again, various combinations of the above. Nor can pus in the wound be blamed for this untoward occurrence, as in the majority of cases there was healing by first intention, and in but few was there suppuration of the wound. Orloff inclines to the view that rupture must be ascribed only to the various causes that bring about tension of the abdominal wall, such as vomiting, cough, inflation of the intestines, etc. There are nevertheless cases in which no such causative agency could be detected by the authors. It would seem that some of the patients do not possess the necessary vitality, and are reduced by malnutrition or other causes to such a condition that their tissues become soft and unduly friable.

OBSTETRICS AND GYNECOLOGY.

Uterine Myomas.—In the choice of operation the surgeon should be governed, according to W. H. BARKER and W. P. GRAVES (*Am. Jour. of Obstet.*, Sept., 1903), (1) by the method or route which will give him the most definite knowledge of the myoma, as to its location, size and relation to the surrounding parts; and enable him to manipulate the uterus and adnexa in his search for others, or in the removal of those already known to exist. (2) By the method or route which will enable him to do his work with little loss of blood, leaving little or no denuded surface after the operation for subsequent adhesions; and with as slight a disturbance of the surrounding viscera as possible to restore the uterus as nearly as may be to its original normal condition, as to size, position, and uniformity of shape. In considering the advantages of the vaginal or abdominal route for this work special stress is to be laid on the provision of subsequent drainage, as in the case of myomas pure and simple, there should be no necessity of drainage, provided always that the surgeon takes proper precaution for good antiseptic work and possesses the requisite skill. The abdominal route possesses all these requirements, but the skill of the operator should be

exerted to the greater degree for the fulfilment of the requirements in the adoption of such a route.

Treatment of Retroversion of the Uterus.—In an analysis of the work of Dr. Figuera, based on the statistics of M. Doleris, M. MORISSETTE (La Gyn., June, 1903) gives the following as his conclusions: (1) The treatment of retrodeviations favors fecundation in sterile women; (2) in recent, mobile deviations, the pessary may be employed with success; (3) the period of genital involution is truly the psychological period for the pessary; (4) where the perineum is intact and there is no lesion of the adnexæ, the Alexander operation is the one of choice. Where there are adhesions to the adnexæ, laparotomy is indicated, followed by simple abdominal fixation and transfixation of the round ligaments; (5) in the case of multiparae where the perineum is torn, fixation should be associated with plastic operations upon the cervix, vagina and perineum; (6) in the case where retroversion is present and complicates pregnancy, medical, manual reduction of the deformity should be practiced. If this does not suffice to free the uterus from the pelvic cavity, celiotomy should be done and the round ligaments should be shortened intra-abdominally, with a view to a direct reduction of the abnormality, and for a definite cure of the deviation.

Outdoor Obstetric Practice.—An interesting report of the results obtained in the outdoor obstetric department of the University of Virginia at Richmond has just been made public by J. F. WINN (Jour. Am. Med. Ass'n, Oct. 3, 1903). The cases number 1,000 and the deliveries were all made by students of the college. The equipment of each student is similar to that provided by other institutions of a like character; interest attaches to one drug, however, croton oil, which is included in the kit, but the specific indications for its use are not stated. The work was carried out under the most filthy surroundings, but the students were compelled to observe the usual precautions as to cleanliness both of themselves and the patient. Out of the thousand cases there were but five deaths, a mortality of one-half of 1 per cent. These did not result from outside or preventable infection, the causes including eclampsia, general septic peritonitis from rupture of an old pus tube, tuberculosis and apoplexy induced by puerperal convulsions. The author believes that this low rate is also influenced by the care bestowed on the genital tract during the third stage of labor, especially as regards the time and delivery of the placenta. He is convinced that too early resort to the Credé method is largely responsible for the incomplete delivery of the secundines and the subsequent sepsis. He advises keeping the hand on the fundus, without making friction, and waiting until the fundus rises and gives to the hand the sensation of being pushed up. This may take as long as half an hour or more, but when there is no sign after three-quarters of an hour, the Credé method may be resorted to. By observing this rule they have not had any so-called retained "placenta," and he claims that an adherent placenta was never seen. The students are taught to regard the genital tract as *noli me tangere* after the child is born, and in proportion to the fidelity with which this is followed out, will the puerperium be marked by fewer deviations from the normal.

Operative Interference in Uterine Cancer.—Cancer of the uterus is truly considered the most terrible affliction that may befall a woman; the more so as only 15 to 18 per cent. of the cases are amenable to surgical treatment. M. A. STRAUCH (Roussky Vrach., No. 35, 1903) finds the percentage of those cured by hysterectomy very small, though immediate death after vaginal hysterectomy has not occurred in his experience even

once. Out of 100 operated cases he only knows of five in whom there was no recurrence within five years. More recently it was advised in operations for uterine cancer not to stop at the removal of the uterus alone, but to continue the extirpation of the entire neighboring lymphatic structures, as was insisted upon quite recently by Wertheim, Mackenroth and others, for even those glands which macroscopically do not seem to contain any cancerous tissue will be found to be infected on closer examination; or they may simply be in a condition of chronic irritation or inflammation. The author begins the operation by preparations similar to those employed in a Cesarean section. Under anesthesia the tumor is thoroughly curedtted, or, if possible, removed by scissors. The vagina is tamponed tightly with iodoform gauze, patient placed in the Trendelenburg position, etc. Of the cases described as operated on one had cancer of the body, while in 17 the lower segment of the organ was so eaten up that it was difficult to decide as to whether he had here to deal with cancer of the vaginal portion or that of the cervix; and only 2 cases were properly vaginal cases. Of the 20 cases 4 died postoperatively, a rather high percentage when compared with the vaginal method of operating, in which there was not a single death; but unfortunately the vaginal route could be chosen only in two cases. Throughout the whole article there is a strain of very discouraging pessimism which is the more impressive as the author's conclusions are based on an extensive surgical practice of twenty years.

Prophylaxis of Postoperative Cystitis.—To avoid cystitis and its dangerous complications after gynecological operations, K. BAISCH (Münch. med. Woch., Sept. 22, 1903) injects 20 c.c. (5½ drams) of a sterilized 2-per-cent. borated glycerin into the bladder, if spontaneous urination is impossible, on the night of operation. The catheter is introduced and as soon as the first drops of urine flow off the fluid is passed in. The patients will generally experience a desire to urinate in five to ten minutes and will empty their bladder without tenesmus. This method has proven a failure only after the Wertheim operation for carcinoma uteri, where the bladder is extensively dissected from its surroundings. Here cystitis is best avoided by washing out the bladder several times with boric acid solution, after every catheterization. This should be continued until the function is completely restored and no more residual urine remains behind.

Absence of Spleen.—Complete absence of the spleen was noticed in the case of a woman, aged seventy-three years, by C. STERNBERG (Virchow's Archiv, Vol. 173, No. 3). The abdominal branches of the aorta were normal as to size and position, except that the splenic artery was very small and supplied the pancreas and finally terminated in the great omentum. Accessory spleens were not found nor was compensatory enlargement of the abdominal lymph-nodes present.

Microscopic examination of the blood and bone-marrow proved absolutely negative. Since the patient reached an advanced age in comparatively good health, another proof is offered that the spleen is not essential to the normal functions of the body.

NEUROLOGY AND PSYCHIATRY.

Bechterew's Disease.—Bechterew described in 1892 a peculiar form of curvature of the spine that is characterized by the following series of symptoms: (1) More or less immobility or at least insufficient mobility of the entire (or of part of the) spinal column without any distinct tenderness on either percussion or flexion. (2) Backward curvature of the spine, especially in the

upper thoracic portion; the head somewhat pushed forward and downward. (3) A paretic condition of the muscles of the trunk, neck and extremities, frequently in connection with an atrophy of the muscles of the spine and scapula. (4) Some loss of sensation mostly in the superficial branches of the lumbar, spinal and lower cervical nerves. (5) Various symptoms of irritation in these nerves in the form of paresthesia and pains in the spine and cervical region, as well as in the extremities, especially when the patient is sitting down. Some cases also show symptoms of irritation in the region of the motor nerves. The etiological factors of the affection are heredity, trauma and syphilis. Marie and Astie described in 1896 a similar disease to which they gave the name of "Kypheohérédó-traumatique." In view of the fact that this disease was first described by Bechterew, Russian investigators proposed to give it the name of "Bechterew's disease." The pathological findings gave a considerable atrophy of the intervertebral plates, at times of such a high degree that some of the vertebrae grew, as it were, together. No ossification of ligaments was anywhere observed. The dura mater was thickened in the cervical region, and adhered to the intervertebral nodes at the exit of the roots. The gray substance of the cervical and thoracic portion was hyperemic; there was also degeneration of the anterior and posterior roots, especially noticeable in the upper thoracic and lower cervical parts. In Bechterew's disease there are found changes in the vertebral bodies and especially in the intervertebral cartilages, while the ligaments remain untouched. POUSSÉP (Roussky Vrach, No. 32, 1903) presents a table of 28 cases which admit of subdivision into two classes: (1) Those in which the irritation of the nervous system was very prominent without any special atrophic condition, and (2) those in which the symptoms of irritation were subordinate to the prevailing atrophy. As regards the age of the patients, the majority were above fifty years. As pointed out above, syphilis was found by far the most prominent etiological factor, next to which comes heredity, cold, trauma and gonorrhea. The knee-jerk was found exaggerated in more than one-half of the cases, while in one there was complete absence of same. Complete immobility of the spine was observed in 35 per cent., partial immobility in 64 per cent. of the cases. It is distinguished from syringomyelia by the absence of the peculiar alteration of sensibility, by the various atrophic changes, etc. The disease is also to be distinguished from the so-called "spondylose rhizomélique," barring the affection of the large joints, by a whole series of phenomena of a purely nervous nature. The latter differentiate it also from various functional diseases of the spine, from senile curvature, and from deformity due to diseases of the muscles.

Multiple Sclerosis with Predominant Psychical Affection, or Possible Westphal's Pseudosclerosis.—Cases of atypical multiple sclerosis, not fully corresponding to the descriptions as given in some textbooks have been reported by many, and especially by Charcot and his disciples, and it is sometimes difficult to distinguish the cases in which the cerebral symptoms predominate from general paralysis of the insane. An interesting case is reported by J. F. KAPLAN (Roussky Vrach, No. 35, 1903) in a field laborer, thirty-six years of age, with a clean personal and family history. Caught a severe cold some seven to eight years ago, after which he was confined to bed for twelve days, during which time "he neither spoke nor ate; was in a dying condition." After convalescence could hardly walk about, acted very strangely, threatened to kill and murder the people around, and even attempted to kill his own son; it was also noticed at that

time that he walked with difficulty, frequently staggered, could not keep his head straight, and his speech became impeded; has also made frequent attempts at suicide. On examination of his nervous system it was elicited that the pupils, of normal appearance, reacted well both to light and accommodation; no nystagmus; fundus oculi normal. When at rest muscles of face and tongue normal; but when speaking the pronunciation is not clear, individual words merge, as it were, one into another, and then break off; the beginning of the word is clear, but its ending loses any definite character; every muscle in the face participates in his attempts to speak, whereby the face takes on frequently a smiling aspect, evidently beyond patient's control. No bulbar symptoms. Trembling of head and muscles of arms, most noticeable when patient walks or makes any motion with his arm; the latter became so pronounced that at times it was necessary to feed the patient. Muscles normally developed; no ataxia; reflexes, both tendon and skin, exaggerated; no ankle clonus. The gait is uncertain, as if patient is not sure of his ground; the steps are unequal, either in size or rhythm, and the uncertainty grows the more embarrassing when patient has to turn about. The general psychical condition is that of dementia, and the change in his mental state dates back from the beginning of his illness. Later on he became apathetic and entirely indifferent to the surroundings; the stupidity and total indifference increased to such an extent that patient was simply leading a vegetable life. Not even the news of his child's death called out any expression on his face; he is, however, at times subject to attacks of violence, of rapidly passing nature. The author surmises that his original illness must have been one which produced distinct organic changes in the nervous system of the patient as the subsequent course of the disease shows it. Notwithstanding the absence of the classic scanning speech seen in multiple sclerosis, the defect is, however, pronounced enough not to exclude this affection, in combination with the other symptoms, such as the involuntary smiling, the absence of hallucinations, etc.; the patient's gait is somewhat paretic, and is not distinctly spastic. The case, to be sure, is atypical, and the psychical defect is rather predominating, but may not just this predominance be the characteristic property of such a class of cases? However it must be admitted that such dementia is rare in multiple sclerosis, and further study of such cases is necessary in order to establish definitely the nature of such complications.

GENITO-URINARY AND SKIN DISEASES.

Acanthosis Nigricans.—According to O. HESS (Münch. med. Woch., Sept. 22, 1903) the chief symptoms of this rare skin-disease are the typical location, the hypertrophy of the dermal papillæ, and the increase of pigment. A distinct discoloration and furrowing will develop symmetrically upon neck, breasts, navel, inguinal region, arms, genitocrural fold, axilla, elbow, hand and foot, which will progress until the areas are studded with simple or branched papillomatous elevations. The mucous membranes become covered with pale or red papillary proliferations, which frequently pain considerably. The course is progressive in some cases, the onset is marked by itching. Severe lesions of the internal organs, usually carcinoma, often terminate this peculiar disease for which there is as yet no satisfactory explanation. The treatment is symptomatic yet in one case a cure is reported after a hysterectomy for malignant decidioma.

Quantitative Determination of Sugar in the Urine.—That the Fehling test is unreliable in cases where there is present an organic combination of iron in the urine,

is the claim made by E. C. BEHRENS (Deut. med. Woch., 1903, No. 35). As a remedy he proposes the following method: An alkaline solution of bismuth nitrate is used which differs from Nylander's reagent in that only one-tenth the amount of the nitrate is used. The nitrate is dissolved in distilled water and then 32.747 grams of the sediment weighed out. Over this is poured 500 c.c. of double normal salt solution and the resulting precipitate dissolved by adding 50 grams of potassium sodium tartrate. Enough distilled water is then added to make a liter. Ten c.c. of this fluid is mixed with 10 c.c. of urine in an Esbach tube and heated in the water bath for half an hour. It is then set aside for fifteen to twenty minutes to cool and the amount of the resulting precipitate, which is bismuth oxydul, is the index of the sugar, every c.c. of the precipitate corresponding to 1.4 per cent. of sugar.

Chance of the Upper Gum.—Extragenital syphilis is a subject that would seem to have been sufficiently exploited by this time, still there occur cases which are of such importance not only medically, but also sociologically, that every new contribution to this subject must be welcomed by the profession. A case not only instructive, but highly interesting because of its rarity, is reported by M. A. CHLENOFF (Prak. Vrach., No. 35, 1903) in a peasant woman twenty-nine years of age, who was admitted to the hospital with an eruption on the body of three days' duration, and pain in the upper gum of two weeks' duration. Patient claims to have been affected from one of her lovers who suffered from syphilis, by using his towels, tooth-brush, etc. The pain in the gum was accompanied by unpleasant sensation, but no tenderness on either eating or drinking. Examination elicited a large swelling that invaded the alveolar processes of a dark, cherry-red color, with prominent vessels on its surface, but without any erosion anywhere around it. Submaxillary glands markedly enlarged, and to an extent the sublingual. The cervical and axillary glands but little affected. The body is covered thickly by syphilitic papules, especially the trunk. The patient was given hypodermic injections of a two-per-cent. solution of hermophenol every other day, and local applications of tincture iodine with glycerin and potassium iodide. After 20 injections the patient left the hospital with the eruption somewhat atrophied, and the chancre considerably paler and absorbed. Patient continued an outdoor treatment of another 8 injections, and subsequently 16 inunctions of 2.0 of mercurial ointment. She entirely recovered, but was readmitted in a couple of months with syphilitic ulcer of the arms; pronounced leucoderma colli, while the former chancre disappeared entirely, leaving but two small cicatrices. While the diagnosis of the case leaves no doubt as to the nature of the affection, the clinical picture of the chancre presents some interesting points. According to Fournier there are two clinical types of this chancre. The first presents the usual phenomena of chancre and is distinguished only by its small size and a semilunar shape embracing two or rather three neighboring teeth; it presents either an erosion or a superficial wound, distinctly limited, smooth, even and of a dark-red color. In the other type of the chancre of the gum the erosion is not limited by a distinct, prominent border, and its bottom is rather uneven, and of a variety of colors; it is also accompanied by symptoms of an adjacent periostitis, and subjective symptoms such as local tenderness, pain, pain on touching, as well as in eating and drinking, etc. In a general way it may be said that the diagnosis of this condition is sometimes difficult and becomes clear only because of the presence of other symptoms, and especially the characteristic adenopathy. The author refers his case rather to the second class, for it resembles

this type more than the other. As etiological factors various authors mention the following: Tooth-brushes, operations on the teeth and mouth, musical instruments, cigarettes, mouthfeeding, unnatural coitus per os, etc.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Changes in Spinal Ganglia after Division of Peripheral Nerve and Posterior Root.—With division of the peripheral nerves K. KLEIST (Virchow's Archiv, Vol. 173, No. 3) found signs of cell-degeneration in the spinal ganglia, reaching their highest degrees during the first month and then slowly disappearing until the end of the fourth month. The lesions involve chiefly the "tigroid" substance or substance stained according to Nissl, the nucleus and the ground-substance. The tigroid substance appears as finely granular or coarse and polyhedral or spindle-shaped masses, while the nucleus will occupy an eccentric position. After severance of the posterior root the same changes are observed, but not to such a degree. The varying appearance of the tigroid substance is most likely due to a difference in cell-structure, which probably goes hand in hand with variations in physiological function. The end stages are always complete degeneration and atrophy.

Esophageal Diverticula.—In a comprehensive article G. RIEBOLD (Virchow's Archiv, Vol. 173, No. 3) states that traction diverticula are very frequent in adults (3.5 per cent. of all autopsies on adults and none in children under fifteen years). Their location is usually the anterior or lateral (more often the right than the left) wall at the level of the bifurcation; in four cases they were seated 5 to 6 cm. (2½ inches) higher, in one case 10 cm. (5 inches) lower, and in another the posterior wall was involved. In the majority of cases only one is found, but at one autopsy there were as many as nine. They all stand in intimate relation with indurated chalotic or anthracotic lymph-nodes. The form most frequently encountered is that of a funnel 3 to 6 mm. (⅓ to ⅔ inches) deep, but a large number of variations may be described. The shape of the opening is not constant and the longest diameter is usually directed obliquely upward. All the layers of the esophagus may participate, but usually the mucous membrane is defective. The clinical importance of these diverticula lies in the possibility of perforation and infection of the surrounding tissues. The stagnating food may set up an inflammation and progressive ulceration or else the gland will suppurate and discharge into the esophagus. The result is an enlargement of the original diverticulum or a purulent mastitis or perforation of the pus into trachea, bronchi, lung, pleura, pericardium or vessels. Carcinoma or tuberculosis are very apt to develop upon the scar tissue of an old diverticulum. The diagnosis during life has never been made. The fact that a glandular inflammation is apt to spread toward the esophagus and draw out its walls is best explained by an obstruction of lymph-channels which permits a retrograde transport of germs. Similar diverticula of the trachea and bronchi have also been described, but here the cartilaginous rings offer a much greater resistance than the soft walls of the esophagus. In the second group, the diverticula by traction and pressure, part of the wall of a traction diverticulum is bulged out or else the entire pouch has yielded and it would be hard to distinguish it from a pressure diverticulum were it not for the remains of glands and chronic inflammation in the neighborhood, and perhaps the deposit of coal in the walls. This group is rare and position and etiology are the same as in the preceding group. Lastly, the pure pressure diverticula claim attention especially

since their causation has been a mooted point. It is probable that the pressure of a morsel passing down the esophagus or forced expiratory acts bulge out a posterior pharyngeal wall weakened congenitally or by trauma. The muscle fibers of the inferior constrictor will yield so that a hernia of the mucous membrane can readily take place. After the bag has attained a certain size the pressure of the contained food will enlarge it more and more. The diagnosis is fairly certain and treatment is also satisfactory; formerly one-fourth of the cases died of starvation or aspiration pneumonia, with pulmonary gangrene, but now a large number are amenable to operation. Lower down in the esophagus, especially on its anterior and lateral wall, above physiological stenoses, similar pathological lesions are sometimes seen, and it is likely that here also a congenital weakness is at fault.

Necrobiotic Changes of Blood.—By keeping freshly-drawn human blood in hermetically-sealed capillaries up to one hundred days, K. Bonon (Virchow's Archiv, Vol. 173, No. 3) could study the resistance of the various cells and the change which they undergo with time. It appears that the large unicellular elements of Ehrlich and the transitional forms disappear first; then follow the large lymphocytes and the multinuclear leucocyte. The neutrophiles seem to be more resistant than the acidophiles. Last of all the small lymphocytes and the red cells are destroyed. The red cells become smaller and thinner, their protoplasm splits up and umbilication disappears, and in the oldest tubes there is complete disintegration. With strophes there is polychromatophilia, hypo- up to complete achromatosis. The appearance of granules within the protoplasm, described in lead poisoning and other diseases, does not seem to be a necrobiotic phenomenon. The leucocytes undergo plasmolysis, the granules are irregularly distributed within the cell-body and show hypo- and metachromatosis, and finally the protoplasm breaks up completely. Eccentric position of the nucleus with change of contour, disappearance of nuclear network, pyknosis, perichromatosis are also observed. On the whole the nuclei and the specific granules resist destruction longer than the protoplasm.

Splenic Leucemia in a Calf.—An interesting observation is recorded by D. A. DeJONG (Virchow's Archiv, Vol. 173, No. 3), who noticed all the lesions of splenic leucemia in a calf five weeks old. The organs were icteric, the spleen as large as in an adult animal, and the blood showed an increase in large unineuclear elements with microcytosis. Since neither lymph-nodes nor bone-marrow gave evidence of any pathological lesion the case must be looked upon as a purely splenic type. The jaundice could only be explained by an increased destruction of red cells in the blood current, since no obstruction in the biliary passages was present. In all probability the leucemia was congenital.

Suprarenals in Congenital Syphilis.—The suprarenal bodies do not frequently show pathological lesions in congenital syphilis, but occasionally gummata are found both in children and in adults. N. GULECKE (Virchow's Archiv, Vol. 173, No. 3) has discovered a new lesion which seems to be characteristic for syphilis. Corresponding to macroscopically visible, yellow, cheesy foci he found irregularly distributed throughout the cortex small and large areas with necrotic cells. Their usual seat is the outer portion of the zona fasciculata and the zona glomerulosa, and their shape suggests an infarct. In the center the shape and arrangement of the cells can still be discerned while the periphery is sharply demarcated from healthy tissue, and is surrounded by a zone of leucocytes. Fat, lime and

pigment are deposited, but cheesy degeneration is absent. In other parts of the cortex there were small accumulations of round cells, and increase in connective tissue, and a slight degree of periarteritis. These lesions were not found in 15 non-syphilitic cases examined, while in 7 syphilitic necrotic foci were present in 3. They are not due to arterial changes, but probably represent a direct destruction of the parenchyma by the syphilitic virus, yet not absolutely specific for syphilis.

Multiple Myelomata.—According to the description of S. SALTYKOW (Virchow's Archiv, Vol. 173, No. 3), multiple myelomata consist of round cells which closely imitate normal marrow cells and which are arranged into irregularly shaped fields by means of narrow bundles of connective tissue. When the cells are closely applied to each other they may have an angular form. The nuclei may be small and dark without distinct structure or large and pale, with nucleoli and chromatin granules. The nucleus generally makes up the greater part of the cell body, but in other places the cells closely simulate flat epithelial elements. Eosinophilic granules may be present in abundance. Some nodules consist almost entirely of blood-spaces lacking an endothelial lining, and filled more or less with tumor-cells; this explains the occasional presence of a large number of colorless elements in the blood. The marrow in the immediate neighborhood of the tumor has a similar structure with many giant and fat cells, but generally lacking the wide blood-channels. In other organs, especially in the liver, there may be accumulations of myelocytes. Macroscopically the tumors in the bone possess a distinctly red color due to their vascularity and to hemorrhages, except in the more peripheral portions. Bone is absent, except on the inner surface of the periosteum, which is continued unchanged over the tumor.

Rupture of Gall-bladder after Carcinoma.—B. HUGUENIN (Virchow's Archiv, Vol. 173, No. 3), performing an autopsy on a man fifty-eight years old, discovered a papilliferous carcinoma, rich in dilated blood-vessels at the junction of the cystic and hepatic ducts. The immediate results were a retention of bile with interstitial biliary hepatitis, dilatation of the biliary passages with moderate new formation of the smallest canals and papillary proliferation of their epithelial cells. The cholemia resulted in hemorrhages all over the body; the most severe bleeding took place from the vascular tumor itself and led to rupture of the gall-bladder, inundation of the entire peritoneal cavity and death. The numerous necroses in liver and pancreas were probably due to some toxin circulating in the blood. In the pancreas they were converted into small cysts, probably owing to autodigestion.

EYE, EAR, NOSE AND THROAT.

A Cause and Cure of Hay Fever.—It is generally admitted now that there are at least two factors of causation in every case of hay fever, the neurotic condition of the nervous system and the exciting cause. Besides these some derangement of the mucous membrane of upper air passages is found in many instances. F. E. STOWELL (N. Y. Med. Jour., Sept. 5, 1903) being a victim of this disease himself, and acting upon the belief that it was a disease of the nervous system and not due to some irritant deposited upon the nasal mucosa began to search for some factor which was present at this time of the year and absent at other times. He hit upon the possibility of an influence from the strongly actinic rays of the sun at this season affecting the very sensitive ciliary nerves and reflexly causing the paroxysms of an attack of hay fever. Acting upon this

mode of reasoning he began to wear colored glasses and found that he was almost immediately relieved. The condition at once returned if he went out without wearing them. He has since improved two or three other cases but is anxious to have the simple experiment tried by others to determine what percentage of cases can be helped in this way.

Rational Treatment for Mouth-breathing.—Diseases of the upper air passages are so common in this part of the country that the climate is held responsible by many as being the chief factor of causation. To be sure a severe climate must necessarily greatly affect mucous membranes which are easily influenced by rapid changes but the improper use of our respiratory apparatus is urged by W. H. FITZGERALD (Med. Rec., Sept. 5, 1903) to be fully as potent a factor as the severity of the climate. So many people are either confirmed or moderate mouth-breathers and all these must necessarily have more or less constant nasopharyngeal catarrh. Many people are not conscious that they breathe other than through the normal passages and will not admit it until you convince them by engaging them in conversation or have them read for you when they will be surprised to learn that they have spoken several sentences or read several paragraphs without once closing their mouths. They are the ones who after lecturing or reading aloud, or perhaps singing, are dry of mouth or husky of speech. Douches are usually harmful in such cases. The nose needs more air not more water. Of course the only rational means of curing such a condition is by removing all growths and deformities which encroach upon the normal passages. This done, the cases of habit mouth-breathing demand care and attention. The nose must be exercised. The patient is ordered to breathe forcibly through his nostrils at the rate of one inspiration per second for ten seconds, to be repeated eight or ten times during the day. This will more than compensate for the discontinuance of the spray. At night a mouth-guard should be worn for weeks. The most satisfactory guard is perhaps a small piece of adhesive plaster worn vertically across the center of the mouth. Great care should be shown even in babyhood to teach the child to breathe through the nose, the possibility of obstruction being eliminated.

Hemeralopia from Parotiditis.—Among the ocular complications of parotiditis, hemeralopia has not hitherto been reported, writes A. CAMPANI (Gazz. Osped., Aug. 30, 1903), who describes a case in which inflammation of the parotid subsided upon one side, only to be followed by inflammation of the opposite gland and development of dimness of vision toward evening, to which succeeded a total night-blindness; though vision was unimpaired during the day. In the absence of any ocular lesion to which this symptom might be attributed, the author places this case in the category with those hemeralopias of toxico-infectious origin. The author's idea as to the origin of the affection in this instance is borne out by the disappearance of the symptom during convalescence.

THERAPEUTICS.

Antimony in Lung Affections.—If given properly, A. ROBIN (Bull. General de Therap., Aug. 15, 1903) considers tartar emetic a remedy of almost specific properties in capillary bronchitis and bronchopneumonia. It is best to first withdraw 200 to 250 grams of blood and then to give a tablespoonful of a solution containing 40 centigrams of the drug to 150 grams of water. With a moribund and cyanosed patient with thready pulse, supervision must be very careful and the administration should be stopped as soon as vomit-

ing or diarrhea appear, or when dyspnea increases, collapse supervenes, or the surface becomes cool. Opium should not be prescribed the same time. It is rare that tartar emetic can be given through an entire day. Generally one must stop and begin again the day after, but with smaller doses. After the severe symptoms have disappeared, another preparation of antimony, the white oxide, does good service in aiding expectoration. While antimony is excellent in forms of pneumonia, where there is a tendency to suffocation, it is a mistake to employ it as routine treatment in this disease.

Oxygen in Surgical Affections.—M. THIRIAR (Bull. d. L'Acad. Royal de Med. de Belg., No. 6, 1903) believes that in oxygen we have an excellent body for combating surgical infections without at the same time injuring the cells. He leads the gas directly over the raw surfaces and into the infected tissues, so as to bring about a continuous oxygenation. In the following affections a rapid cure was brought about: (1) Suppurative arthritis of the knee. The pus is evacuated by lateral incisions and the gas then passed through the joint. (2) Purulent and tuberculous peritonitis. (3) Empyema. (4) Gangrene with the formation of gas. (5) Furuncles, carbuncle and anthrax. The gas is here frequently injected into the dead tissue and the surrounding induration.

Protargol in Gonorrhreal Disease of the Cervix and Body of the Uterus.—Protargol, as is well known, was originally recommended by Neisser in gonorrhea, in which it was used at first in one-quarter-per-cent. solution, increasing the strength up to one-half per cent. to one per cent. Since then the drug has also been employed in gynecological practice, as well as in diseases of the eyes. V. N. ORLOFF (Roussky Vrach., No. 31, 1903) used it in 25 women, of whom six had disease of the cervix and eight also affection of the mucous membrane of the body of the uterus. As the infectious principle of gonorrhea tends to spread by continuity of tissue, we can seldom see infection of the uterine mucous membrane without disease of the cervix. The author had to deal mostly with recent infection, so that permanent alterations, either in the body or cervix, had not as yet taken place. Bacteriologically 13 cases gave the diagnosis of gonorrhea, while in the rest the nature of the infection was made out from the undoubtedly past history. Treatment consisted in swabbing either the cervix or the uterine mucosa with a protargol solution of five per cent up to 15 to 20 per cent; at no time was there ever noted any special irritation. After the swabbing or the injection a glycerin tampon was usually placed at the mouth of the cervix, which was left there for six to eight hours, to be followed by a sublimate or boric acid injection. The treatment was usually conducted every third day. Improvement was noticed after the third or fourth sitting, as was manifested by the diminution of the leucorrhreal discharge, both in quantity and in its character. The gonococci disappeared, and the treatment was then limited only to the glycerin suppositories. No complications of any kind were ever observed. There was no marked improvement in disease of the tubes.

Treatment of Erysipelas.—The contagious character of erysipelas had been known long before its pathogenic bacillus was discovered, and could be easily verified by the extensive prevalence of the disease in certain wards of hospitals. It was Fehleisen, who, in 1883 discovered the streptococcus that causes the disease, and since that time dates our wider familiarity with this affection; its treatment, however, is as yet a more or less debatable ground, for on the one hand prominent authorities recommend the expectant plan,

while on the other a whole array of therapeutic measures has been placed at our disposal to combat the further spread (once the disease has invaded the tissues) of the infection. P. PH. SMOLTCHEFF (Prakt. Vrach, Nos. 29 and 30, 1903) brings forth the names of such surgeons as Dieulafoy, König, Hüter, Wolff and others, every one of whom recommends a different line of treatment. This diversity of views is explained by the fact that a majority of investigators consider erysipelas a self-limited and comparatively benign disease, which can often be treated locally with success, and for this we must have a remedy that is readily absorbable by the skin, and, on being taken up by the deeper layers, is powerful enough to kill the pathogenic streptococcus, or, at least, prevent its further pernicious activity; it must at the same time, when taken up by the systemic circulation, neutralize the existing toxins and fortify the living cells against their invasion, inviting meanwhile leucocytosis to more successfully combat the attack of the enemy; clinically such a remedy should bring about diminution of pain, swelling and heat, prevent the further spread of the erythema and cause the fever to fall perceptibly. As satisfying all the above demands the author finds the alcoholic tincture of iodine of the greatest importance. In view of the fact that the author bases his opinion on experience of twenty years, due weight must be attached to it, for he considers this preparation of iodine specific in a measure that quinine is considered in malaria. The following combination has been especially useful in the author's hands:

B Tr. Iodi 25.0 grams.
Ol. Camphor
Ichthyoli aa 12.5 grams.

M. Sig. For external use. Shake before applying.

The application to be successful should be done very thoroughly, and repeated when necessary. Twice a day may be sufficient; if not, the application is done three times daily. Even phlegmonous cases seem to be beneficially affected by the drug.

Empyroform.—Empyroform, a condensation product of tar and formalin, is a dry, non-hygroscopic brownish powder of slight odor. It is insoluble in water, but dissolves readily in acetone, alkalies and chloroform. Employed as such or mixed with zinc and starch it forms an excellent dressing for weeping eczema, according to B. SKLAREK (Therap. d. Gegenw., July, 1903). Other ways of applying it are as ointment, paste and varnish. The application is generally very pleasant, since the itching stops rapidly. Irritation and intoxication, such as fever, vomiting, diarrhea and green urine has never been observed. Patients who cannot stand tar will readily tolerate empyroform if the strength is increased very gradually. Good results were also obtained in psoriasis, prurigo and trichophytosis, and for all forms of eczema it must be regarded a specific far superior to tar itself.

Influence of Nutritive Enemas on Peristalsis.—By studying the peristaltic movements of stomach and intestines in cats that had received nutrient rectal enemas and whose peritoneal cavity was then opened under water, O. LOEWE (Zeitsch. f. klin. Med., Vol. 50, Nos. 3 and 4) finds that with a sufficient amount of opium the small intestines and the stomach will not participate in the movements of the colon and rectum so that the danger of hemorrhage would not be increased in gastric ulcer or duodenal affections. Since, however, the larger part of the injections reach the ileocecal valve, there would be considerable risk in perityphlitis and typhoid. Finely suspended particles, such as dioplets of oil, may rapidly ascend in the gastro-intestinal tract

and even reach the esophagus without exciting peristalsis owing to osmotic processes. The danger of a hemorrhage would not be increased by this if non-irritating substances only are used. The influence of injections upon gastric and intestinal secretion has not yet been studied sufficiently, yet it is probable that certain substances as alcohol can stimulate secretions without necessarily interfering with physiological hemostasis.

Phorxal, a New Iron Preparation.—This remedy, but lately introduced for use in anemia and chlorosis, is very highly spoken of by TAUSCH (Berl. klin. Woch., 1903, No. 38). It is a mixture of albuminoid bodies made from the blood cells of cattle and contains a number of organic combinations of iron and phosphorus derived from the hemoglobin, the lecithin and the nucleoproteins of the blood. It comes in the form of a fine powder, odorless and almost tasteless, and soluble in watery liquids. The albumin content is about 95 per cent. The iron is united to an organic group of atoms, derived from the hemoglobin, and one of the advantages of the preparation is that the action of the gastric juice does not disintegrate the material and forms a muriate of hematin, as is the case with the ordinary hemoglobin preparations. It is of value in primary and secondary anemias, and also in those combined with nervous exhaustion. In the latter case its nutritive properties are also to be considered and the usual daily dose of 6 to 10 grams may be doubled or trebled. No unpleasant after-effects were noted in any of the patients.

Treatment of Burns with Glycerinate of Tannin.—In the treatment of burns of whatever degree M. CAPURBANO (Gazz. Osped., Sept. 13, 1903) has found the glycerinate of tannin the most satisfactory substance for local application. If the burn is of the second degree, he empties the vesicles of all fluid and then applies glycerin and tannin in a 50-per-cent. solution, and covers the whole with a dressing of gauze and cotton. The medicament is reapplied several times during the day without removal of the gauze; this being left permanently in place till it becomes detached spontaneously upon formation of the new epithelium. In third-degree burns, sloughs are removed and the same dressing applied. The author attributes the beneficial effect of this treatment to the power of the tannin to coagulate the albuminous substances of the tissues and thus form a protective coating; and also to the antiseptic qualities of both tannin and glycerin.

Gastric Contents in Gastroponts.—Although it has been recognized by all observers that the gastro-intestinal symptoms are usually the most marked manifestations of enteropontosis very little work has been done in regard to the motor, chemical and sensory disturbances of the stomach in this condition. T. R. BROWN (N. Y. Med Jour., Sept. 26, 1903) has made careful examinations of the stomach contents in 20 cases of gastropontosis and for purposes of comparison has divided them into three series: Those with slight dilatation, those with moderate dilatation, and those with considerable or extreme dilatation. Nearly all cases gave marked symptoms of neurasthenia, the character and severity of the symptoms not depending upon the amount of dilatation. Although the series is a small one the results which he obtained would suggest that in simple gastropontosis there is a slight diminution in the amount of free hydrochloric acid in the majority of cases; where the dilatation is moderate the free hydrochloric acid is still further reduced, while in those cases associated with marked dilatation an absence of free hydrochloric acid is the usual occurrence. *Gastropontis per se*, therefore, seems to lead to very slight diminution of the free hydrochloric acid.

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No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	\$4.00
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LEA BROTHERS & CO.,
No. 111 FIFTH AVENUE (corner of 18th St.), NEW YORK.

SATURDAY, NOVEMBER 14, 1903.

PRESENT NEEDS OF THE MEDICAL PROFESSION.

IN his address as the retiring President of the New York State Medical Association, delivered at the recent meeting of that body, printed in full in the November number of the *Journal of the Association*, Dr. Frederick Holme Wiggin calls special attention to certain crying needs of the medical profession in our generation that must be attended to if there is to be any amelioration of evils long complained of, but still continuing.

He shows that although much has been done to organize the medical profession in this country there are still, according to the secretary of the American Medical Association, more than seventy-five thousand physicians in the United States who are not at present members of any medical organization. If present-day evils are to be eradicated, more universal union of the profession is absolutely demanded. How this can be brought about remains one of the serious problems that those who have the best interests of the medical profession at heart must endeavor to solve.

Dr. Wiggin considers that it is evident that there is a necessity for a change in the form and attractiveness of existing medical organizations, if it is desired to unite the members of our profession in a few strong and closely allied societies.

He quotes Sir Victor Horsley, M.D., who, in a recent paper, said "Organizations, medical or otherwise, are purely temporary; their only purpose is to meet the needs of the moment and when those organizations fail to keep pace with the natural evolution of the circumstances under which we have to live, it is quite clear that we ought to reconstruct the various machines that we have in operation." As Dr. Horsley has had very extensive experience in recent years as to medical organization, in various attempts to reorganize the British Medical Association in such a way as to make it effective for professional purposes, his words should go far in the matter.

He considers that at the present time, there are two professional requirements, social and scientific. Under the social requirements are placed the right to practice, defense from unjust attacks and the enforcement of our rights by the prosecution of illegal physicians.

Here in New York, much has already been accomplished beyond what has ever before been attempted as regards some of these social requirements. The defense of physicians against blackmailing suits for malpractice is now assumed by the New York State Medical Association for all its members, and already the rule is that, in most cases, suits never come to trial, for the plaintiff realizes the futility of fighting legally with a large and powerful medical association and also feels that much of the sympathy that ordinarily goes out to the plaintiff on the part of the jury in these cases is neutralized by the fact that the defendant is a physician in good standing and that brother physicians are united in his defense.

When medical societies generally shall have adopted this system introduced by the New York State Medical Association they will doubtless see the same encouraging increase in membership that has followed the diffusion of the knowledge with regard to defense against blackmail here in New York State.

Undoubtedly there are other features of medical society life that will admit of improvements calculated to make the membership of these bodies not only larger but more united. As at present constituted, proceedings are often too formal and the social side of organization is not sufficiently cultivated. Commonly to have members of the profession meet on a plane of sociability is to get rid of many of the temptations to friction in practical life and obviate in the easiest possible way by prophylaxis infractions of medical ethics.

While meetings are primarily intended for mu-

tual help from a scientific standpoint and for the rapid, easy diffusion of medical advances, it must not be forgotten that physicians do not cease to be examples of the animal sociale and opportunities for the cultivation of the amenities of life must be afforded.

The close union of interests that could be thus secured, if all the practising physicians of this country were brought into intimate contact with brother practitioners, would redound not only to the benefit of the profession but also to that of the public by more effectual regulation of medical abuses. Those sincerely interested in medical advance and in the public welfare owe it to themselves to spare no effort in this direction with the purpose of securing efficient medical union as the greatest crying need of our time, and in itself the solution of most of the other medical abuses of which we hear so much complaint.

GEOGRAPHY AND INSANITY.

MENTAL disease as a medical entity and insanity as a social disorder should be regarded separately if a due appreciation of the many features, medical and sociological, is to obtain.

It has been the custom of many who have not borne these distinctions in mind to misinterpret statistical inquiries bearing on this subject not only in this country, but in Europe also. As a result there obtains a widespread belief that insanity, as a medical entity, is greatly on the increase, whereas a much more correct interpretation would be that the great increase in the number of inmates of asylums is due less to medical than to social factors which are capable of putting an entirely new face on the interpretation of the statistics.

One of the most apparent of those social factors is the diminishing dread of putting one's friends in a madhouse. Modern palaces with all the conveniences of our best hotels are now offered to an indigent population and it is little wonder that this single feature has encouraged the placing of many in institutions who heretofore have been taken care of at home and have not entered into statistical summaries.

A still more important factor is correlated with the former. The increasing population causing the fierce combat in urban communities drives unfortunate sub-producers out of a family circle, the privilege of which, by reason of many ties, they have been permitted to enjoy. From being family dependents they become community parasites and thus contribute to swell the apparent tide of

increase. Other and more complex social factors are constantly at work all tending in the same direction and lead to the hasty assumption on the part of the lay public of an unparalleled increase in the amount of medical insanity.

At the present time there is almost no method by which the relative importance of these factors may be ascertained. Our statistical methods in medicine are crude beyond belief, and it is more than doubtful that without an unpractical increase in their complexity can trustworthy results be obtained. Given those we do possess, however, it is significant and hopeful that the figures of the United States Census Bureau can be made to yield a number of important preliminary results leading to a more correct understanding of some of these social factors, and what is still more important, the interpretations seem to afford sufficient ground on which to base rational legislation looking toward the amelioration of some of the unnecessary consequences that our country as a whole must suffer from existing social regulations.

The study to which we refer is on the "Geographical Distribution of Insanity," first published in part, in the *Journal of Nervous and Mental Disease* and now completely, with illustrative maps, in the *National Geographical Magazine*, October, 1903, by Dr. William A. White, the recent appointee to the superintendency of the Government Hospital for the Insane at Washington—a fit preliminary study certainly for one in such a central position.

The influences of climate, natural physical topography, rain-fall, and other purely meteorological conditions are severally considered and are very wisely referred to a secondary and mediate position in the interpretation of the geographical distribution of these diseases. In the mental factors involved in the struggle for existence are to be found the primary causes of mental deterioration and breakdown; concomitant conditions of civilization being responsible. One of the most apparent features connected with the movement is the concentration of population in a certain restricted area. The North Atlantic division bears the brunt of the evil effects of this massing of struggling humanity—particularly in the large cities; the proportion of insanity being in direct ratio with this larger factor. The movement of the population, both as a factor of growth and as a factor in mental decay, has certain features in common, which are well brought out in Dr. White's studies.

We cannot summarize, save at great length, this careful and thoughtful presentation, but the question of the distribution of insane immigrants is of practical legislative interest. Dr. White shows that fifty per cent. of the 25,000 insane of New York State are foreign born. This has resulted from the indiscriminate taking in of the offscourings of Europe. This—unrestricted immigration—is one of the great ulcers in the social disease of insanity—only exceeded by the greatest curse that can afflict a nation—war.

We can commend this paper most earnestly to physicians, politicians, and legislators as one worthy of the most careful consideration in the study of the relation of mental breakdown to healthy national life.

EDITORS AND THEIR CONTRIBUTORS.

We sympathize with the attempt of the *Boston Medical and Surgical Journal* to extricate itself from the embarrassing position in which it recently placed itself by publishing a pseudo-scientific paper on the ill health of the historian, Francis Parkman. The paper was an exceedingly ill-conceived and ill-executed attempt to show that Parkman owed his poor health to the alleged fact that he had not worn the proper kind of spectacles. It was in line with a series of papers by the same writer—a Philadelphia ophthalmologist—in which the desperate attempt has been made to attract attention to an overridden theory by affecting to show that Darwin, Huxley, Carlyle, Wagner, and some other celebrities were the victims all their lives to their having neglected to correct an alleged eye-strain.

With the character and purport of these papers we do not intend to concern ourselves in this place. We are content to leave them to the judgment to which the scientific world will undoubtedly subject them, and to the oblivion to which it will eventually consign them. We have no relish for the task of writing them down. Such would be a work of supererogation in the case of literary products which are foreordained to perish. The moral we wish to point is one which concerns the relation of an editor to his contributors.

We take it as a fact that an editor's duty does not end with his merely disclaiming responsibility for the opinions expressed in a paper which he accepts for publication. His duty certainly does not end there. When he publishes a paper he, of course, does not assume responsibility for the opinions conveyed in it, but he does assume

some measure of responsibility for giving them currency. Otherwise the editorial function would be reduced to the mere task of *accepting*, instead of *selecting*. The selective function is, in truth, one of the highest functions of an editor. In it are involved important duties to his contributors, to his readers and to his journal.

It is not always the simplest matter in the world to distinguish the chaff from wheat in the articles contributed, nor can the editor always have the clairvoyant power to detect the many motes that mar some productions. But it is one of the most important of his functions to try to detect the lack of both moral and scientific qualities in the papers that are submitted to his judgment. Herein lies a fine ethical question, in the solving of which the editor has a profound duty to his readers.

The subject is clearly illustrated in the case of the *Boston Medical and Surgical Journal*; although we do not doubt for a moment that our contemporary is suffering from a temporary lapse of judgment rather than from an intentional fault. Having published this questionable paper, it indulged in some mild critical comments, and was immediately taken to task by the writer of the paper, who insinuated that the editor in criticising one of his contributors was guilty of a courtesy to a guest. The contention is, of course, absurd; and, moreover, it has nothing to do with the question of the health of the historian Parkman, or with the kind of eye-glasses he wore. It has also nothing to do with the question of the eye-strain of Mr. Darwin or Mr. Huxley or anyone else, nor even with the "thousands of cases" which have been quite miraculously cured of many frightful diseases by the imposition of Philadelphia spectacles. But it has the desired effect of putting the editor on the defensive, and he is disgusted to find that he must use his critical faculty to defend himself, instead of having originally used it to consign the author's screed to the waste-paper basket.

We live in just the age for these things. The times are prolific in all sorts of "healers" who play their antics, literary or oratorical, before the public in their own ways. Dowie and Mrs. Eddy are, of course, outside the pale of rational criticism; but unfortunately there are spectacular prophets within the ranks of the medical profession itself, and these do not scruple to distort facts, to originate fantastic theories, to use exaggerated language and to indulge in coarse invective, Dowie-like, against those who can detect at

a glance their crude follies. Criticism is wasted upon such extremists as these; but every medical editor should know, what the *Boston Medical and Surgical Journal* is now finding out, that one of his duties is to protect, as far as possible, his readers by excluding from his columns those papers that do not bear the stamp of conscientious methods of analysis.

THE REAL PLACE OF ALCOHOL IN MEDICINE.

An aspect of the subject of the physiological effects of alcohol, that appears to be ignored or neglected by those who have done most to illuminate it, is its course and chemical changes after ingestion.

It is well known that alcohol is rapidly taken up by the stomach and intestinal branches of the portal vein, and thence is conducted to the liver, where it is partially or wholly oxidated. In the instances when a quantity is imbibed which is in excess of the capacity of the liver cells to oxidate, the surplus alcohol, being passed on to the heart and general circulation, then recommences oxidation after the return from the lungs to the left heart, which continues until it is consumed.

Alcohol is a very high oxidant, *i.e.*, it is very inflammable and possesses a high affinity for oxygen, also it is very diffusible, and environmental bodies are very prone to become impregnated by it.

When alcohol is ingested, diluted, or in combination with foodstuffs, its absorption and oxidation are very much slowed and the saturation of the other substances, by the alcohol, results in a combined oxidation of average duration and intensity, both consuming together. Thus we have illustrations of the influence of diffusibility upon combustion. In sweet wines and beer we have examples of this slower combustion.

In whisky and brandy we have illustrations of highly alcoholic non-saccharine beverages, which when imbibed undiluted, and consumed in moderate quantity, undergo active portal combustion, thus utilizing more or less of the available oxygen of the portal blood, or, when taken in immoderate amounts, in exhausting the portal blood, and hence depriving the tissues of oxygen, adequate for their normal katabolism, and serving simultaneously in thus lowering the general volume of blood oxygen.

We have vivid illustrations in habitual drinkers of general fatty overproduction and especially fatty degeneration of the liver cells; and in heavy drinkers, of the above, together with endocarditis

of the left heart, and sclerosis and atheroma of the aorta and arteries, and capillary fibrosis. The general suboxidation is attended with general tissue softening and more or less colloid degeneration, which, together with urea and uric acid excess, are the principal causes of vascular obstruction and high blood pressure. These conditions may also be aggravated by the ingestion of meats containing an excess of uric acid, when the systemic oxidation is too low to accomplish its combustion; and by other associated causes of lowered oxidation.

It has long been observed that gout is common to sweet wine and beer drinkers, and that the imbibers of the more diffusible and higher oxidants whisky and brandy are immune. Thus it is that highly diffusible liquors saturate, and enhance the oxidation of, the less oxidizable foods, and the colloid and uric acid products of the body suboxidize disintegrations, while those in sugar combination, owing to their lower diffusibility, but yet of higher combustibility than other foods, serve by their hyperactive combustion, in thus depriving other, principally the nitrogenous foods, of an amount of oxygen adequate to their complete metamorphosis.

The fact that alcohol lessens general oxidation and hence the general metamorphosis of tissues and foodstuffs, and thus acts as a "saver of protiens," does not warrant the statement that alcohol is or acts as a food. It appears to be a great mistake to confound or place in the same category, the elements of nutrition, and agents which cause a stagnation in the processes of katabolism of the tissues, or of the oxidative metamorphoses of foodstuffs, for, manifestly, these latter ones are pathogenic processes and lead to grave maladies.

Certainly, the supply of food, and the processes of its metamorphoses, are not analogous and neither can it be said that nutrition can be maintained or even sustained by retarding oxidation. It is observed that many diseases of suboxidation are attended by wasting and even marasmus; in fact, the increase of lean tissue, by such measures, is rarely if ever attained, while conversely the body-weight, thus heightened, is due to fatty deposit, more or less of which is at the expense of lean tissue. A diminished appetite thus produced, while it lowers the demand for food, does not maintain the same nutrition, as though the additional food had been ingested and normally appropriated by the tissues. In accepting protoplasm as the bases of life and index of nutrition, we must reject alcohol as a *food* or nutrient.

That alcohol does by its superactive combustion consume the available oxygen of the portal blood, and thus lower general oxygenation, is attested by the sclerosis (burns) of the hepatic cells and the lowering of the general temperature following its ingestion. The immediate effect of alcoholic beverages is increased warmth, parallel to its alcoholic percentage content, followed by a corresponding fall of temperature.

The true place of alcohol in medicine, then, is as a transient, highly diffusible stimulant, incident to its active portal oxidation, and *directly*, as an oxidant, for the purposes of clearing the portal circulation and for assisting the hepatic combustion of certain foods, which, as above mentioned, is accomplished by the more diffusible (highly alcoholic) liquors.

In clearing the portal circulation the active combustion of alcohol acts similarly to that of the fruit acids, which are so popular among hearty eaters for this purpose. For the restoration of appetite and digestive ability, which formerly was afforded by an orange or lemon, the advanced epicure finds the more highly diffusible and combustible cocktail necessary, with which to precede his meal.

Medical men can and do make legitimate use of alcoholic liquors for the above therapeutic ends, and by regulating the amounts and varieties, the time of taking, in relation to food, etc., maximum good and minimum evil can be attained, in appropriate cases. Continued tippling and periodic sprees are almost equally degrading to the body as a whole. The ignorant or rash uses of alcoholic beverages are the chief causes of mischief which is due to them. There can be no doubt but what all points taken into consideration, the race as a whole would be far better off without them.

The many diseases due to inebriety, it will be observed, are of the degenerative type and are all due either to hypercombustion (fibrosis, sclerosis) or to suboxidation, viz., all kinds of degradations and degenerations of the brain, nervous, muscular and vascular systems.

ECHOES AND NEWS.

NEW YORK.

The D. W. Harrington Lectureship, University of Buffalo.—The Medical Faculty of the University of Buffalo has chosen Dr. Samuel J. Meltzer, of New York, to deliver these lectures for 1903. The subject selected by Dr. Meltzer is "Edema, a Consideration of the Physiological and Pathological Factors Concerned in its Formation." The lectures will be de-

livered in the Medical College, November 30, and December 1, 2, and 3, at 5 P.M. The medical profession is cordially invited to attend. These are the first lectures given on this foundation. Lectures will be given as often as the income from the fund will warrant.

Professor Lefferts' Gift to Columbia Medical School.—Dr. George M. Lefferts, who has announced his intention of retiring from the Chair of Laryngology on June 30 next, when he will have finished thirty years of academic service, has presented to the University his extensive and valuable collection of apparatus for illustrating the teaching of laryngology and rhinology. The Trustees ordered that the apparatus should be hereafter known as "The Lefferts Collection."

New Professors at Columbia.—Five new professors in medicine were appointed, the first two of whom are to have seats in the Medical Faculty. The appointees are Drs. Samuel W. Lambert, Professor of Applied Therapeutics; Joseph A. Blake, Professor of Surgery; George E. Brewer, Professor of Clinical Surgery; John S. Thacher, Professor of Clinical Medicine; Frederick Peterson, Professor of Psychiatry.

New Hospital Pavilion.—At a recent meeting of the Board of Managers of St. Luke's Hospital, the president, George MacCulloch Miller, announced the desire of Mrs. Margaret J. Plant, to erect and present to the institution an additional pavilion, thus pursuing the line of development laid down in the plans for the erection of the ten pavilions, five of which have already been built. The new pavilion, as announced in the MEDICAL NEWS of last week, will be for the care and treatment of private patients, and will be located on the southeast corner of the block overlooking Morningside Park. Mrs. Plant's gift solves a problem of long standing for St. Luke's. Since the hospital was moved from Fifty-fourth street to Cathedral Heights, private patients have been cared for on the two upper floors of the Vanderbilt pavilion. The facilities for the care of patients in this building have been inadequate, and the nurses have been cramped in their quarters. The development of the hospital was absolutely checked by this situation. Now the management will be enabled to open wards which, by reason of lack of income have been closed, and thus enlarge the charitable work of the institution.

Obituary.—Drs. O. A. White and L. P. Walton.—At a meeting of the Medical Association of the Greater City of New York, held November 9, 1903, the report of a committee, appointed to prepare a suitable minute on the death of Dr. Octavius A. White, was received and adopted. It was devoted to a eulogium of the character and eminent services of the deceased, and included the following tribute quoted from the *Oakland (Cal.) Tribune*, of May 28, 1903: "There has just died in New York, one of the greatest of the heroes produced by the Civil War; yet his name is absolutely unknown to ninety-nine out of every hundred of his countrymen. This hero was Dr. Octavius A. White, famous as a yellow fever expert. When yellow fever attacked the Federal prisoners at Florence, South Carolina, his attention to them was tireless. All during the terrible years of civil strife he was indefatigable in healing the sick and wounded of both armies, and risked his life and health in the pursuit of his high calling with greater frequency and daring than any soldier in the field. It is a commentary on the unequal division of the awards of merit, in popular estimation, that the heroism of such a man should be passed over and forgotten by the mass of men, while the deeds of hundreds of lesser men, who sought

to slay or win glory on the battle-field, are commemorated in marble and bronze. . . . We raise monuments to those who kill, and leave unmarked the tombs of those who cure." The conclusion of the report was as follows: "With a public life full of noble achievements for suffering humanity and a home life illumined by the most charming of domestic traits, his memory will be cherished for years that are to come by all who knew him. Your Committee, in presenting this minute, unanimously offer the following resolutions."

RESOLVED, That in the death of Dr. Octavius A. White this country and community have lost a valued citizen and our profession of medicine an honored member.

RESOLVED, That we extend to the bereaved family of Dr. White our profoundest sympathy for them in this their period of bereavement. "Vivat Post Funera Virtus." (Signed) Thomas E. Satterthwaite, John G. Perry, Reynold Webb Wilcox, Committee.

Dr. Luis P. Walton was among the earliest members of this Association. Born in England fifty-odd years ago, he came to this country with his family at an early age. He was educated here, having been graduated at Columbia College in 1863 and at the College of Physicians and Surgeons in 1870. His death, which was sudden enough to be almost tragic, occurred in London early in September of this year. He was one of the few representatives of the old school of general medical practitioners, and in that capacity he occupied a position of peculiar confidence and affection in the hearts of a large number of patients. They sought his advice in many other matters besides those appertaining to their physical ills, and they always found in him a patient and sympathetic listener and a sound and earnest adviser. Few who have not been general practitioners themselves can realize the extent of the responsibility and of the unremitting toil involved in caring for a clientele as large as his. He was a genial, kindly gentleman of wide sympathies and general interests, with a vigorous, active, masculine intellect; always cheerful, courageous, sympathetic, and ardently devoted to his friends. For public professional honors and appointments he cared but little, but he was ever loyal to the profession of medicine and generous in his dealings with its members. The suddenness of his death was very shocking to his family and friends, who were wholly unprepared for it; but it was exactly the kind of ending which he would have chosen for himself. Although well aware that such an end was not unlikely from the persistence of certain symptoms whose gravity he did not underestimate, he was uncomplaining, patient, heroic, with a depth and earnestness of character well known and recognized by his intimates; possessed of a shrewd and droll humor and a remarkably alert intelligence. His affectionate devotion to the land of his birth, which amounted almost to a passion, never made him unfair to the land of his adoption, and always inspired respect among those who knew him best. George L. Peabody, Henry S. Norris, Committee.

Dr. Emil Rosenberg, who died Wednesday at his home, 138 West Eighty-fifth street, was known through this and other countries as an authority in the medical examinations of applicants for insurance policies. He was seventy-four years old and came to this country from Germany in 1868, since which time he had been the senior medical examiner of the Northwestern Mutual Life Insurance Company. He was a prominent member of the German Medical Society and other scientific bodies.

William B. O'Rourke, Superintendent of the Metropolitan Hospital on Blackwell's Island, died at the hospital last week from cancer of the stomach. He was born in this city fifty-five years ago. When he was thirteen years old he entered the Harlem Rail-

road machine shops as an apprentice, working under Richard Croker, who was foreman. Later he became chief machinist in the shops and after that was appointed inspector of boilers in the United States Steamboat Service. In 1890 Mr. O'Rourke was appointed steward of the Homeopathic Hospital on Ward's Island. The next year he became warden of Bellevue Hospital, which position he retained until 1896. In 1898 he was again appointed Warden of that institution.

PHILADELPHIA.

College of Physicians.—The College of Physicians of Philadelphia, at the recent meeting, authorized the president, Dr. Horatio C. Wood, to appoint a committee of eight, including himself, to arrange for the preparation of plans for the new building the college proposes to erect on the new lot purchased last spring. The college has a nucleus of \$24,000 for its building fund.

Cures by Lorenz Method.—It is stated that Dr. James K. Young is confident that three-fourths of the operations by Philadelphia surgeons, by the Lorenz method, for congenital dislocation of the hip will prove effective. The cases operated on here, by Lorenz and local surgeons, exceed 50 in number, and Dr. Young believes that more than 40 of the reductions have been successfully accomplished. Patients here seem to respond more readily to treatment than do those in Austria. These views are of course based on the progress of the cases thus far in their treatment.

Vaccination Urged.—The authorities of the Health Department are unceasingly urging upon the people of the city the necessity of vaccination. The outbreak of smallpox which has lasted for several weeks shows no signs of abatement. During the forty-eight hours previous to the time of writing this letter, 13 new cases were reported. Numbers of the public school buildings are being closed temporarily for disinfection. A representative of the Bureau of Health has lately visited the various medical schools of the city in order to vaccinate any students desiring such protection. This was entirely optional on the part of the students.

Streets to be Cleared of Beggars.—Orders have been issued to the police of the city to enforce the laws relative to clearing the streets of beggars, tramps, fakirs and station-house lodgers. This move followed a conference between a committee from the Philadelphia Society for Organizing Charity and the Director of Public Safety. It is believed that if the laws are enforced the begging population will fall into three classes: (1) Many will disappear; (2) some will find their way to the places provided by the city for those who have no home nor means of support; (3) exceptional cases for which charity can and should provide will be looked after by the Society. To dispense with police-station lodgers, the Society will furnish policemen with tickets admitting homeless men and women to their two lodging houses where a bath, bed and two meals will be furnished for three hours' work.

National Association for the Study of Epilepsy.—The annual meeting of this society was held at the College of Physicians, Thursday, November 5. The address of the President, Dr. Wharton Sinkler, dwelt upon the necessity for organized and concentrated effort against epilepsy and stated the purposes of the Association. Among the most important of the number of papers that were read were those of Dr. J. Chalmers DaCosta and Dr. John C. Munro regarding the operative treatment of epilepsy. Both

speakers asserted that operations for the attempted relief of epilepsy are entirely too numerous. Dr. William N. Bullard, of Boston, was unanimously elected President for the ensuing year. The other officers were reelected.

Hebrews Plan New Hospital.—A movement originated some time ago among the Jewish residents in the southern part of the city for the erection of a new hospital has recently taken definite shape. The Mt. Sinai Hospital Association has purchased on the east side of Fifth street, between Reed and Dickinson streets, a lot 88 by 241 feet in size. On this it is proposed to erect a modern hospital to cost at least \$100,000. One of the principal reasons for establishing the hospital is the distance from that locality of the Jewish Hospital in the northern portion of the city.

Compulsory Vaccination in Allegheny.—As one of the sequels of the recent investigations in Allegheny City the Board of Health has instituted compulsory vaccination in that city. Dr. Benjamin Lee, Secretary of the State Board of Health, says it is the first occasion in recent years in which compulsory vaccination has been enforced in a large city in Pennsylvania. The records show that last month there were in Allegheny 87 cases of smallpox and 22 deaths, hence the direction of the State Board is absolutely compulsory.

Home Study.—Superintendent of Schools Brooks has sent a circular to the principals of the elementary schools calling attention to the amount of home study to be assigned to the different grades. The rules are as follows: First. In the first and second grades, no home study is to be assigned. Second. In the third grade not more than half an hour, and in the fourth grade not more than three-quarters of an hour of home work is required. Third. In the fifth grade, not more than one hour; in the sixth grade, not more than one and a quarter hours; in the seventh grade, not more than one and a half hours, and in the eighth grade, not more than from an hour and a half to two hours of home work is required. These are maximum limits of time not to be transcended for any reason whatever. If any teacher assigns home work requiring more time than specified above, she is not complying with the direction of the Superintendent, based upon the action of the Board of Education.

Obituary.—Dr. Franklin Van Artsdalen, a well-known physician of this city and Lower Merion Township, died at his home November 5, aged sixty-nine years. He graduated from Jefferson Medical College in 1856. The deceased was prominently identified with many secret societies, particularly the Masons and Odd Fellows.

CHICAGO.

Chicago Surgical Society.—At the annual meeting of this Society, held Oct. 19, 1903, the following officers were elected for the ensuing year: President, Dr. E. Wyllys Andrews; Vice-President, Dr. Malcolm L. Harris; Secretary, Dr. A. E. Halstead; Treasurer, Dr. Daniel N. Eisendrath.

Oak Leigh Educational Sanitarium.—A new sanitarium has been opened at Lake Geneva for the treatment of children suffering from nervous and mental affections. The institution, which is now under the private supervision of Dr. Mary E. Pogue, former resident physician of the Illinois Hospital for Feeble-minded Children, will be known as the Oak Leigh Educational Sanitarium, and the object will be to meet the present needs for the treatment of

the mentally deficient children. The aim of the sanitarium will be to correct the causes of deficiency, if possible; to house the unfortunate children in attractive hygienic surroundings; to educate them in the line of work to which each child responds most readily, and to prepare them for living rather than to incarcerate them for life. Supporting Dr. Pogue, as a supervisory board, are Drs. Daniel R. Brower, Sanger Brown, Archibald Church, W. S. Christopher, Homer E. Halbert, and Wm. G. Stearns. The sanitarium is the offspring of an idea of friends of the Children's Hospital at Lake Geneva to establish and affiliate it with some such institution, but a lack of funds made this impossible. Kindergarten, medical and corrective gymnastics, the correcting of speech defects, articulation, counting of beads, and the less exhaustive methods of mathematics, modeling in clay, basket and mat weaving, and the control and understanding of self are to be taught, each child receiving individual instruction. This is a most commendable enterprise and much needed, because physicians in Chicago are being constantly called upon to recommend institutions for the treatment of mentally defective children.

Case of Blastomycosis.—At a meeting of the Chicago Medical Society, held Nov. 4, 1903, Dr. E. A. Fischkin reported and showed a case of blastomycosis. The patient was an Italian, fifty-one years of age, whose family history was negative. His wife and children were healthy. Patient had had a keratosis on the side of his nose for fifteen years without undergoing any change. The present disease began in May of this year. A pimple appeared near the external corner of the eye; he scratched it with his finger, shortly after which it became sore and began to enlarge. A similar lesion appeared on the back of the neck. When patient first presented himself, the lesion around the eye covered an area of about three-quarters of an inch in width and one inch in length, extending from the lower eye-lid and encircling the external canthus and reaching the upper lid. A photograph of this stage of the disease showed the extent of the lesion. Under potassium iodide and X-ray treatment the patient has shown marked improvement. Patient is still under treatment.

The Mechanical Methods in the Cystoscopic Treatment of Kidney and Ureteral Diseases.—Dr. Gustav Kolischer read a paper with this title before the Chicago Medical Society, saying that the direct local treatment of ureteral and kidney diseases, by the aid of the cystoscope and the ureteral catheter, is not as popular among the surgeons as should be expected. Possibilities of this method may be summed up as follows: Cases of pyelitis, especially those of gonorrhreal origin, will heal under repeated flushings of the kidney pelvis through the ureteral catheter. Impacted ureteral gravel can occasionally be loosened by the ureteral sound. The same holds good of ureteral stones. The author's method of running a catheter up to the impacted stone and then injecting vaseline oil, has often been successfully employed by the essayist and others. This method in releasing the impaction meets a vital emergency in removing the cause of reflectoric, bilateral anuria without exposing the patient to so dangerous an operation as ureterotomy. Ureteral catheterization and flushing may be used in order to remove pus plugs. Certain cases of ureteritis can be cured by injecting antiseptic solutions into the diseased part of the ureter. The results in ureteral strictures are still far from satisfactory on account of technical

shortcomings. Occasionally, a laterally located ureteral fistula can be cured by a permanent ureteral catheter. The question arises: Is the favorable influence of this method on certain cases due to any specific action of the fluid used, or simply due to mechanical influences? The author is inclined to favor the latter explanation, for the reason that pyelitis cases will rapidly improve, especially so far as the general condition of the patient is concerned, although only indifferent fluids were used for the flushing. Patients, carriers of ureteral stones, improve rapidly and stay in this improved condition for a long time, although the repeated flushing of the ureter with the indifferent fluids didn't dislodge the stone or the calculi at all. The author tries to explain these facts by the following theory: In an inflamed renal pelvis, or around an impacted ureteral calculus, pus and débris will be precipitated and accumulated. Decomposition in these masses will lead to the formation of toxines and subsequent absorption of those into the system. Therefore, the appearance of certain symptoms which will disappear after repeated flushing has removed these infectious deposits. Decomposition, absorption and the reappearance of the symptoms will recur if newly formed deposits are again precipitated. Although the author expects improvements and more numerous and more satisfactory results from these methods, he wants to caution against any overflow of enthusiasm and against reports which are more enthusiastic than are apt to stand for a rigorous criticism.

The Limitations of the Practical Value of Urethroscopy.—Dr. Louis E. Schmidt said that the achievements of urethroscopy has been gained from two directions. The cognizance of certain facts has been obtained by comparing and studying the findings of the superficial appearance of the urethra during operations and autopsies. Their pathological changes were made to coincide with these, so that deep seated as well as only superficial changes, are to be correctly diagnosed by determining the correct urethroscopic image. Experience has positively shown that urethroscopic examinations not only have often been useless, but that frequently repeated urethroscopic manipulations have been distinctly harmful to the general condition of patients. The urethroscopic tube of appropriate size should admit of easy introduction. If small (in diameter) tubes are used, the sought-for information is not easily gained, while if a sufficiently large tube is employed and forced through very dense infiltrations, distinct reaction will follow, probably due to the carrying of infection to the deeper layers. There is an actual demand for urethroscopy during the course of a large number of cases of chronic gonorrhea. Those cases that cause one to believe that one of certain localized processes are present and which do not yield to routine treatment. The localized processes may be infiltrated ulcerations with a depressed center, hard granulations, coated fissures, encircling rigid infiltrations, involvement about and within the urethral glands or other processes which tend to occur in patches.

Superficial Ulcerations.—Here the long and light gonorrhreal threads are not found, but irregularly shaped flakes, usually thicker in the center and even dark in color, microscopically shown to be blood, will be found to float in the urine. The involved areas can only be correctly located with the urethroscope. The presence of coated fissures may be strongly suspected if patients observe, after a nocturnal pollution or after the sexual act and frequently

after each urinary act, a distinct shock always in the same place and continuing for some time. Here again the urethroscope can be of service. Stubborn granulations are to be suspected whenever regular sounding produces more or less profuse hemorrhage each time. As a rule these granulations will not yield except to heroic treatment through the urethroscope. Infiltrations of greater extent and rigidity manifest themselves by the appearance of a more catarrhal secretion. It is important to locate these infiltrations and to diagnose their character, because different infiltrations call for an entirely different mode of treatment. The diagnosis and indications are made with the urethroscope. Another group of symptoms, those of a sexual character, forcibly suggest the use of the urethroscope.

American Electro-Medical Society.—The first annual meeting of this Society will be held December 1, 2, and 3, at the Masonic Temple, Chicago. This society, which already numbers over one hundred and fifty members, has for its object "Investigation in Electricity and Allied Sciences, and the Encouragement of their Application to Medicine and Surgery by the Formation of District and Local Societies." Papers will be presented by Dr. John B. Murphy, Chicago; Dr. Byron Robinson, Chicago; Dr. G. Bettom Massey, Philadelphia; Dr. C. S. Neiswanger, Chicago; Hon. John M. Smulski, city attorney for Chicago; Dr. J. Rudis-Jincinsky, Cedar Rapids, Iowa; Dr. H. Preston Pratt, Chicago; Hon. Edward B. Elliott, city electrician for Chicago; Dr. Clarence Skinner, New Haven, Conn.; Dr. J. N. Scott, Kansas City, Mo.; Dr. R. S. Gregg, Chicago; Dr. Mirhan Kassabian, Philadelphia; Dr. T. Proctor Hall, Chicago; Dr. A. D. Rockwell, New York; Dr. Carl S. Beck, New York; Dr. Heber Robarts, St. Louis, Mo.; Dr. John E. Gilman, Chicago; Dr. Chas. G. Davis, Chicago; Dr. O. P. Clemensen, Chicago; Dr. J. P. Hetherington, Logansport, Ind.; Dr. C. W. McMichael, Chicago; Dr. O. S. Barnum, Los Angeles, Cal.; Dr. Elmore S. Pettyjohn, Chicago; Dr. Geo. F. Hawley, Chicago; Dr. John E. Harper, Chicago; Dr. Lloyd Hammond, Chicago; Dr. F. A. Leusman, Chicago; Dr. C. D. Collins, Chicago; Dr. Hamilton Forline, Chicago; Dr. R. H. Bartlett, Chicago; Dr. H. P. Fitzpatrick, Chicago.

CANADA.

Want Tuberculosis Dispensary Established in Montreal.—At a recent well-attended meeting of the Investigation Committee of the Montreal League for the Prevention of Tuberculosis, a resolution was unanimously passed favoring the establishment of a dispensary in that city for cases of tuberculosis.

Public Health and Railway Cars.—Assurances have been given by the superintendent of dining, parlor and sleeping cars of the C. P. R. R. in Canada, that everything in connection with their service is kept in a satisfactory clean condition. After a run across the continent all these coaches are cleaned by the compressed air system, and every ten days all these cars are thoroughly disinfected, and fumigated by means of formaldehyde. If any contagious disease is known to have been carried by any particular car that car is immediately put out of commission, and not used again until it has been satisfactorily disinfected. When a supposed consumptive has occupied any of these coaches the linen and blankets utilized are subjected to a separate washing, with an absolutely irreproachable disinfection.

Action Taken Against Physicians.—The Pharmaceutical Association of the province of Quebec has

laid charges in the Police Court of the city of Quebec against a number of the physicians of that city who have been in the habit of giving their prescriptions to unlicensed druggists or to unregistered drug clerks. Actions have also been entered against several druggists accused of selling poisons to the public contrary to the provisions of the Pharmacy Act.

Changes in the Quebec Medical Act.—The College of Physicians and Surgeons of the Province of Quebec have decided to recommend at the next meeting of the legislature of that province that their Medical Act shall be amended to provide for a five years' course of medicine instead of four as at present prevails. They will also advise that the clause providing for the registering of those holding English degrees without further examination in Quebec shall be rescinded. In addition to this it will be recommended that the requirements for matriculation for French students shall be a B.A. degree, and for the English as at present holds.

Manitoba Medical College.—The Manitoba Medical College began its present session with the largest freshman class in its history. This numbers something over forty, and it is the twenty-first session of the College. The most prominent feature of the Medical Act of the province of Manitoba is that those receiving degrees from their provincial university shall not be required to pass an examination before the Medical Council of the province. All they have to do is simply to register, present their diploma and pay the necessary fee of \$75. For the present session the following changes have been made on the staff: Dr. J. O. Todd has been appointed Professor of Anatomy in succession to the late Dr. Neilson; Dr. James McKenty and Dr. James Pullar have been appointed assistant demonstrators of anatomy. Dr. W. L. Watt will conduct the practical and physiological chemistry.

GENERAL.

Prof. von Mikulicz on America.—In lecturing recently at Breslau, Professor von Mikulicz spoke of his recent trip to the United States. He praised American surgeons and said he found more fruitful ideas among them than among the French or English. Part of the allusion was as follows: "The time is past when we were the givers and the Americans the receivers. The American character has as a fundamental feature unlimited self-confidence. The American believes he can do anything that is wanted, and he wishes to see America regarded as the most beautiful and most preeminent land in the world. Nevertheless, we have no ground for fear, for, in the sharp economic contest, the Germans have some advantages over the Americans. The latter recognize the efficiency of the Germans, calling them the 'Yankees of Europe.'"

Drunkenness Among English Women.—In the last report of the London County Council, regarding drunkenness in London, it is stated that of 90 persons taken into custody for habitual drunkenness 89 were women. Whatever these remarkable statistics may indicate, it is certain that they do not represent the proportion of habitual drunkenness in the two sexes. While moral degradation of any sort is more complete and hopeless in women than in men, it is a matter of common observation that the latter furnish the majority of cases of alcoholic and drug excess.

Alcohol is Depopulating Normandy.—The population of the five departments of Normandy is 150,000 less than it was thirty years ago, and the decrease is attributed wholly to the excessive use of alcohol. M. Debove, the dean of the Paris Faculty of Medicine,

shows how alcohol operates in two directions toward the diminution of the population—by raising the average of mortality and by weakening the vitality of the majority that survive. There are places in Normandy where the consumption of brandy is more than a quart per day per head of the adult population. Alcoholism is said to have got a firm hold on a large part of the female population. In the "fairly temperate" canton of Tourove the average weekly consumption of raw spirits is a little over three and a half quarts for each male adult and about two quarts for grown up women and young children.

Liverpool Institute of Comparative Pathology.—The London *Times*, according to *Science*, states that in connection with the Liverpool Institute of Comparative Pathology (Liverpool University), of which Professors Boyce and Sherrington are directors, a tropical veterinary department has been established. Its objects are to train veterinary and medical men in the tropical diseases of animals, to afford facilities for research in such diseases and organize expeditions, and to organize preventive measures in the tropics against diseases of animals. A memorandum on the subject has just been issued by the institute. It is pointed out that the advantages which Liverpool possesses for the study of tropical medicine are equally applicable to tropical veterinary medicine, there being an immense foreign cattle trade with the port. The Johnston Laboratory of Liverpool University, opened last May by Mr. Walter Long, M.P., contains the fully equipped laboratories of the Institute of Comparative Pathology, of the Tropical School of Bio-Chemistry and of the Cancer Research Committee, and is directly connected with the departments of bacteriology, pathology and physiology. These subjects, closely associated in the new Thompson-Yates and Johnston Laboratories, it is pointed out, mutually help one another, and thus increase the thoroughness of training and greatly promote the opportunities for research. The secretary of state for war has approved of the course laid down by the institute, and in future officers of the Army Veterinary Department will be sent to Liverpool for their special training, the Army Department paying the fees. The Liverpool School of Tropical Medicine also trains officers sent specially by the government. In connection with the new department it is desired to establish a practical post-graduate class in veterinary medicine, and also a school of veterinary medicine. Firms interested in the cattle trade have subscribed a considerable sum toward the expenses involved, but further funds are needed.

Another Century Old "New Discovery."—From *Science* we clip the following: "A hitherto undescribed visual phenomenon.—To the Editor of *Science*: The phenomenon of apparent movement described by Dr. Geo. M. Gould, of Philadelphia (*Science*, XVIII, 536), was discussed in 1896 by Professor S. Exner in an article entitled 'Ueber auto-kinetische Empfindungen' (*Zeits. f. Psych. u. Physiol. d. Sinnesorgane*, XII, 313). According to Exner, the first observation on record was made by Alexander von Humboldt in 1799. Several authors (among them men as well known as Aubert and Charpentier) have occupied themselves with the phenomenon, and it forms the subject of an experiment in Sandford's *Laboratory Course*, 1898, 109.—E. B. Titchener."

New Jersey State Medical Regulations.—Dr. John V. Shoemaker comes out in an editorial in the November number of his *Medical Bulletin* denouncing the New Jersey State Board of Medical Examiners for "the erection of a Chinese wall of exclusiveness which shall shut out practitioners from other States from practising

within its borders." It purports to give a truthful statement of facts sustaining this charge, but in reality distorts the facts and misrepresents the medical legislation and policy of New Jersey. The article is the subject of considerable comment and as it unfairly represents the situation in that State Dr. E. L. B. Godfrey, Secretary of the State Board of Medical Examiners of New Jersey, gives the following reply: "The author of the article on 'Reactionary Measures in New Jersey,' published in the *Medical Bulletin*, of Philadelphia, edited by Dr. Shoemaker, of the Medico-Chirurgical College, is not familiar with the medical statute nor with the rules and regulations governing the licensing of physicians by the State of New Jersey. No legally qualified physician of another State is debarred from visiting patients in this State, provided he does not open an office or put up a sign. No graduated physician is debarred from taking the State examination for medical license, provided he can meet the requirements of the State. No physician is debarred by the State of New Jersey from obtaining an indorsement of a certificate of license issued to him, after examination, by another State, provided the standard of academic, medical and examining requirements of that State is substantially the same as that of New Jersey; and provided further that the candidate for license complies with the same conditions as are required from candidates examined by this State. The academic requirements for a State medical license are based upon a diploma issued after four years of study in a high school of this State. A diploma from a chartered school of equal grade, or a certificate of examination for admission to the freshman class of a literary college, will be accepted as equivalent. Candidates not possessing such diplomas may present evidence of their academic education to the State Superintendent of Public Instruction at Trenton, who is authorized by the State to determine the equivalent of the high school course and to issue certificates which admit to the State examination or indorsement. Full credit is given for any literary, scientific or commercial branches candidates may have studied. Failing to possess the required credentials, candidates may be examined by the State of County Boards of Examiners for Teachers. The Medical requirements are four courses of lectures of at least seven months each, in four different calendar years, prior to graduation from a legally incorporated college. The subjects of examination are the same as they have been since 1894 and consist of fourteen branches of medicine and surgery.

"New Jersey does not prevent any physician from locating to practice medicine in this State who can meet the educational and moral requirements of the State. New Jersey has been one of the most progressive States in the matter of indorsement and has, at this time, reciprocal relations with probably as many States as any State in the Union. The author of the article referred to appears to be a Pennsylvania physician and in his complaint that New Jersey will not indorse a Pennsylvania license forgot to state that Pennsylvania does not indorse the New Jersey license. He demands as a right from New Jersey a courtesy which Pennsylvania does not grant in return. Pennsylvania denied this courtesy to New Jersey when the standards of the two States were equal. Now that our educational standards have been raised to a par with those of New York, the Pennsylvania standards remaining the same, that State cannot reasonably expect indorsement, neither has New Jersey the legal right to grant it. The medical statute of New Jersey is surpassed by none in this country. It is based upon extensive study of the subject, as presented by the States of Massachusetts, New York, Ohio, Indiana, Illinois and other States, and was framed by those who have had long experience in State medical

examinations. It has the approval of the Medical Society of New Jersey and of the Homeopathic State Medical Society and has been sustained by the Court of Errors and Appeals. Similar statutes govern the practice of law, dentistry and pharmacy. The statute instituting State medical examination was enacted in 1890. It has done more to build up the educational standards of the medical profession of New Jersey than any enactment since the incorporation of the State Medical Society in 1790. At the present time, the proportion of physicians in New Jersey is about 1 to 600 of the population. The demand of the people in these progressive times is not for more physicians but for better educated ones."

Obituary.—Dr. S. S. Lathrop, of Norwich, Conn., thirty-nine years old, was instantly killed Nov. 8, as the result of a collision with an automobile.

CORRESPONDENCE.

MINING AS A SPECULATION.

To the Editor of the MEDICAL NEWS.

Sir: I cannot refrain from expressing my appreciation of your special article on "Speculative Investments for Physicians," in the current issue of the *News*. As a physician who has lived in Colorado for nearly 10 years I have no hesitation in saying that it is almost impossible for one here in the center of the mining industry to get back his principal if he invests in any form of mining. Appreciative patients often give their physicians absolutely disinterested advice, yet, in spite of this investments almost invariably result in loss. Fortunes are made in mining in States like Colorado, but they are made by the men whose training fits them for practical mining work. Where one physician wins, hundreds are sure to lose, and the first advice which we are apt to give to brother practitioners who come from other States is to scrupulously avoid speculative investments. We can no more play the promoter's game successfully than he can come into our offices and conduct our work. The best a physician can do with his savings, be they small or large, is to put them in a good savings-bank or a good first mortgage bond and be content with a low rate of interest.

While talking about investments, those of us who live in the West might refer to such concerns as the United States Steel Corporation, but that is "another story."

PHYSICIAN.

Denver, Colo., Nov. 6, 1903.

SOCIETY PROCEEDINGS.

OBSTETRICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, June 4, 1903.

The President, Dr. John M. Fisher, in the Chair.

Placenta Previa and Its Treatment with Especial Reference to Combined Version.—This paper was read by Dr. Daniel Longaker, who said that the report included 17 cases, all of which were seen by the reporter and all but two treated by him. There was but one maternal death, the last he had treated. In this case as well as in the others, combined version was elected. The placenta was completely over the os; labor at term; moderate bleeding; child presenting transversely. The patient was a multipara, and since reading the paper it was learned that she had committed an abortion on herself about a year earlier. The infant was born by the woman's unaided efforts, after version, in forty-five minutes. There was no bleeding

and none until the manual removal of the placenta, which was markedly adherent. After this moderate oozing continued in spite of an intra-uterine gauze pack; death occurring in three hours. Combined version yielded the most brilliant results in the earlier cases, from the earliest period of fetal viability to the thirty-sixth week and it acted as a most certain means of controlling hemorrhage and of exciting labor pains. It was a certain means of inducing labor. The operation is easy; and the small baby stands compression better than the large one. At least in six of the 11 cases was the baby born alive, and only 8 of the entire 18 were saved. (There was a case of twins.) In every one of the cases of combined turning at or near term the baby was lost. The operation of internal version afforded no better results and was mentioned only to be condemned. One case, a short head first labor, with dead baby, illustrated the inherent dangers of the situation for the child. The method of combined version is believed to be free from danger if the rules laid down by all authorities from the time of Hicks be followed. The most important are to introduce one or two fingers; turn, and wait. The waiting does not mean added risk to the child in the author's opinion and experience. It would be more rational to pay as little attention to the fetus in placenta previa as in ectopic pregnancy; then the warning hemorrhage would be the signal for active aggressive interference, and many cases would be safely disposed of in the later months by combined version. Some of those reaching term would be disposed of by the same plan; others by gradual mechanical dilatation, rupture of membranes, and forceps. All, however, would be actively treated in realization of the fact that the woman's safety lies in evacuation of the uterus. The danger from hemorrhage would be greatly lessened; but there still would remain the remoter ones of septicemia, an embolism and rupture of the uterus, to all of which complications the peculiar conditions predispose. There would remain a small maternal mortality. Of the 17 cases reported, in 10 the placenta was centrally implanted, in 6 marginal, and in one not given. Combined version was employed in 12 instances, internal version in three and in two cases the membranes were ruptured and forceps applied. There was only one maternal death and 10 fetal.

Dr. E. E. Montgomery, said in the discussion, that he was greatly interested in the papers read, and that although these cases covered a period of a number of years, some of them having been delivered before the methods he emphasizes were particularly advocated, it is evident that the management of these cases is excellent. When one comes to look at the side of the mother, the record as made leaves little to be desired. One must, however, keep in mind that in this class of patients the interests of two individuals must be considered. The best record that has been made under this plan of procedure has been pretty close to 55 per cent. mortality for the child. It was his privilege to read a paper before the Philadelphia County Medical Society in 1883 upon the subject, "Is Craniotomy Justifiable for the Living Child?" In this he took the ground that it was not. Following the same line of thought it occurs to him that any plan of treatment which affords a mortality of 55 per cent. for the child, is one which should lead its practitioners to consider earnestly whether there were not other measures that afforded but little increased danger for the mother, and greatly increased opportunities for the child. The plan of procedure he has in view is that of Cesarean section. He appreciates the fact that it requires a considerable amount of moral courage to urge upon a patient, who is certain for an opportunity for delivery with a mortality of one per

cent., the necessity of an abdominal incision with its well-known perils, for the sake of her child. There are many cases, however, in which the birth of the living child is of very great importance to the parents, and in which they are willing to take great chances, and it seemed to him it would be the better part of the obstetrician in every case where the symptoms indicate the presence of a placenta previa to make known the dangers and possibilities that might be afforded for their escape for the child through some operative interference. The hemorrhage in these cases gives an indication of the character of the trouble, and enables the physician to prepare himself to perform the operation under careful aseptic precautions. He is able to choose the time when the operation should be done. There are cases, especially those in which the cervix is rigid, where dilatation is likely to be slow and difficult, that Cesarean section would afford an increased advantage for the mother. In the performance of the operation it is important that the patient should not have been subjected to careless manipulation or examination previously. The plan of procedure which he had opportunity to practise, in a few instances, during the time he did obstetrical work, is that which affords an excellent opportunity for the life of the mother, the Braxton-Hicks method of version, which has been so well described. It is, however, in those cases in which the placenta covers a good portion of the uterine orifice, a procedure exceedingly dangerous to the child.

Dr. Stricker Coles said: Dr. Longaker's mortality is about 5 per cent. for the mother, and about 50 per cent. for the child. He has in that, of course, some cases of central placenta previa, and that should go to this credit, because that is given as the mortality of the lateral varieties. When one comes to the central placenta previa, Truesdale gives a maternal mortality of about 18.9 per cent., and a fetal mortality of about 70 per cent. He has collected from a large number of cases and has had the best mortality statistics he has been able to see. These figures give an idea of the danger of this condition. Many of these cases come to the obstetrician late, and when hemorrhage has occurred he does not think one can expect to save the child. After a woman has bled until she is almost pulseless and exsanguinated, the chances for a living child are very slight. Two cases have come to him lately in which the child was nearly seven months, and in each case he performed version and used the foot simply as a plug, trying to get the patient to react. In one case delivery occurred in twelve hours; in the other, in six. Both mothers made good recoveries. In such cases one cannot expect to save the child. In cases when the child is not very large, it can often be saved by the method of version, and by taking more time than one would when the child is larger. The cases in which the child is large, the patient having gone nearly to the full term of gestation, he thinks are much more difficult to treat. Version and slow extraction will lose a great many children, but if the children are hurriedly extracted the maternal mortality is increased. With Cesarean section one has a mortality in the last five years of about 5 per cent. What would be the mortality of Cesarean section if we could get the cases in the early stage. Control hemorrhage for a short time by packing with iodoform gauze until ready for operation. He thinks there is a field in some of these well-advanced cases of pregnancy with central placenta previa for Cesarean section, and will expect to see the mortality for mother and child reduced, especially when these cases are placed in a hospital early, or preparation made for prompt treatment at their homes.

Dr. Oliver Hopkinson, Jr., said he thought every case of placenta previa is a law unto itself, and the best results will follow careful study of each case. The advantages of the different operations depend greatly upon the variety of placenta previa. The safest plan, he thinks, is by the old Braxton-Hicks method—dilatation just large enough to admit grasping of the foot. His habit is to grasp the anterior foot, if possible, and after extraction, use it as a tampon, either allowing the labor to end spontaneously or use it as a plug, if there be an excess of hemorrhage. He thinks that method the safest for the mother. He believes the lives of the mother and child in placenta previa are antagonistic, and, in trying to save both, you are likely to lose the mother. If the fetal heart is heard, and the mother is in good condition, he thinks Cæsarean section would be the operation par excellence.

Dr. George M. Boyd said he thought the paper brought out the necessity of carefully studying all cases of ante-partum hemorrhage, and impressed upon the profession the necessity for careful diagnosis in ante-partum hemorrhage, for the early diagnosis will mean often the successful treatment. The treatment in his opinion will depend upon whether one gets the case early or late. If the patient has bled profusely and the pulse is rapid there is nothing to do but podalic version as a method of tamponing the cervix or plugging the uterus and emptying it. In central placenta previa, if the diagnosis is made early, if the child is viable and the patient in good condition, the physician does not do his full duty unless he tells his patient of the danger, the high mortality to the child and gives her the privilege of selecting between the two methods of treatment, podalic version or Cæsarean section. His course has been slow delivery after having accomplished version. He agrees with those who state that rapid delivery means a higher mortality for the mother.

Dr. George Erety Shoemaker said that Dr. Longaker is to be congratulated on the results which he is able to present, considering the class of cases which he has had to deal with and the conditions surrounding them. They were not in maternity hospitals, but were taken as they came, often in poor condition from hemorrhage, under poor surroundings, and his results are excellent. The question as to whether version is the best method of handling placenta previa depends on just that point. Is there any other method known which could take the 18 cases just as they stood at the time they came to Dr. Longaker and yield him a mortality as low as that which he has given? Dr. Shoemaker thinks the answer must be that there is no other method. Tamponing and forceps and Cæsarean section certainly would give a larger mortality both for mother and child. As to Cæsarean section, it seems to him that that is a procedure which can only be considered in a very few selected cases seen and diagnosed early, under good circumstances, and where for some extraordinary reason the life of the child is of such importance that it can offset the increased danger to the mother. Cæsarean section even in the hands of the most expert has not yet reached the state where the maternal mortality is as low as in the average delivery by podalic version.

Dr. I. P. Strittmatter said that from his observation in 2,100 obstetrical cases he has seen five of placenta previa, one of complete placenta previa in which the placenta was adherent over the internal os and four cases of partial or marginal placenta previa. The method which he has pursued, and which he thinks he would pursue again under similar circumstances, has been to make an examination as soon as hemorrhage appears. If the os is not sufficiently dilated, it should be dilated enough to see what is the matter. Having determined this, the portion of placenta contiguous to the internal

os should be detached, the os packed with iodoform gauze and then the case should be studied. It is hard sometimes to determine the proper course, especially when the surroundings for operations are unfavorable. In one case of placenta previa hemorrhage occurred five weeks before delivery. It was a slight hemorrhage, but it was very easy to make a diagnosis. By packing the cervix with iodoform gauze, allowing it to remain for seventy-two hours, washing out and repacking there was no recurrence of the hemorrhage until the time of delivery at 8½ months. The placenta was not perforated. The foot was seized and the delivery accomplished, using the child as a tampon, with a favorable result for both mother and child. In partial placenta previa packing with iodoform gauze and watching the case has yielded good results. In three cases podalic version was performed with recovery to mother and child. In the fifth case the child was delivered with forceps. This case was very interesting, because it was impossible to keep the packing in its proper place by the ordinary methods and it had to be held in position to dilate the os for the use of the forceps. The hemorrhage was slight in the beginning, but it did not recur after sufficient dilatation had taken place to allow the occiput to enter the external os. Personally, he is in favor of podalic version in every instance when there is slow dilatation of the os or inability to control hemorrhage by packing with iodoform gauze. When the hemorrhage can be controlled he thinks it is better to wait for a time, particularly so, if there has been severe hemorrhage. The early diagnosis in placenta previa is everything, and every patient applying for obstetric service, in the presence of any hemorrhage, should be carefully examined and her case carefully studied. If this examination does not yield a decisive result as to the cause of hemorrhage, it should be repeated until a result can be obtained. This offers the best chance of a successful outcome of the case.

Dr. John W. West said that his treatment of placenta previa has been podalic version in every case.

Dr. Richard C. Norris said that no plan of treatment suitable to all cases could be selected. There are three main conditions which would determine the course of action in any given case: The state of the cervix, the degree of hemorrhage, and the variety of the placenta previa. It is well known to those who have had experience with these cases, that where lateral or marginal placenta previa occurs the hemorrhage may be slight; often indeed, not recognized unless the physician studies the attachment of the amnion to the placenta after it has been delivered. The lower uterine segment, thinned, overstretched and edematous, is readily torn and severe lacerations and hemorrhage can follow the speed that one would use ordinarily in extracting. There will be some cases even after version in which the hemorrhage may not be entirely controlled, and here it is well to remember that by slight and steady traction on the foot the hemorrhage can be controlled without injury to the cervix. When one considers the maternal and fetal mortality of placenta previa and determines to try Cæsarean section to improve it, one must remember the unfavorable conditions. The majority of cases are premature births. We have to deal with a premature child and with a child that is more or less exsanguinated. The infant mortality is and always will be great, despite the more rapid delivery. These cases are not ideal cases for surgical interference. He predicts that as time goes on, Cæsarean section will pass away as a means of treatment for placenta previa, and that more and more will we depend upon version and slow extraction, as heretofore outlined. He would lay stress upon the dangers of the third stage of labor in these cases, the hemorrhage fol-

lowing the birth of the child. No one should attend a case of placenta previa without having at hand the appliances to treat this alarming condition. The insertion of a utero-vaginal tampon from the fundus to the vulva, kept in place for twenty-four hours, and gradually removed, is the only treatment. To attempt to stitch any lacerations, is a loss of valuable time. In conclusion, he said that from his experience and knowledge of the experience of obstetricians throughout the world, Hicks has done more to reduce the mortality of placenta previa than has been accomplished by any other treatment, and that placenta previa can never be practically treated by Cesarean section.

Dr. Charles P. Noble said that his own experience leads him to take that ground most decidedly. While he has not had a large experience, he has had the happy fortune of seeing all the mothers recover. Two cases in which he was consulted, ended fatally because version was not done promptly. The patients bled to death before version was attempted. Aside from these personal results, he thinks the statistics of the treatment of placenta previa in general, bear out the belief that the Braxton-Hicks method of version gives us the best results.

Dr. Longaker, in closing, remarked that the practical difficulties that present themselves to his mind in consideration of Cesarean section have been so fully answered by Dr. Norris that there remains nothing for him to say. Dr. Hopkinson asks a question about the hand used. Dr. Longaker has never ceased to be thankful to one of his teachers, Dr. Penrose, for the very emphatic way in which he impressed that point upon our minds in his lectures. He would say, "Use that hand which, when held between pronation and supination, the palm corresponds to the child's abdominal surface." It is a very good rule, and he follows it in doing internal version. Version is usually feasible by the combined method. The head is easily displaced. The shoulders come into contact with the intrauterine finger, the other hand depresses the breech, and the knee and foot drop into the intrauterine finger's reach. An assistant or an intelligent nurse can often render useful assistance by making pressure upon the fundus.

Exhibition of Specimens.—Dr. W. Reynolds Wilson exhibited this case. It was one in which the performance of Cesarean section, followed by hysterectomy, was necessary on account of multiple fibromyoma of the uterus. The indications were perfectly outlined; the obstruction to the passage of the child was absolute, inasmuch as the pelvic cavity was completely filled with a pedunculated tumor. The cervix was pushed forward, and was entirely out the axis of the pelvic canal. It is unusual to find the indications for the operation so clear. In the majority of primiparous women the question of Cesarean section is based entirely on measurements. This in some instances is indefinite. The woman, a primipara, had reached the beginning of the ninth month of pregnancy. The condition of the kidneys made it necessary to terminate pregnancy at once. There was acute nephritis with blood and granular casts in the urine. The child (weighing 5½ pounds) was rapidly delivered with the uterus *in situ*. Dr. W. Reynolds Wilson found it impossible to deliver the mass from the abdominal cavity before extracting the child, because the pelvic tumor was so great that he could not carry his hand back through the ample incision sufficiently deep to draw out the impacted tumor from the pelvis while the child was still in the uterus. The uterine incision was made at a point on the anterior wall, between the subperitoneal tumors which studded the uterine surface. The amount of hemorrhage was not excessive. The bleeding was constant, but it arose from the delay in reaching the mass in the pelvis, and

in getting the tumor completely out of the incision in order that ligation could take place. The adhesions were moderate, so that the operation in this respect was ideal. The mother and child are both in good condition. The uterine tumor weighed seven pounds.

NORTH BRANCH OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting held Thursday, Sept. 11, 1903.

Dr. H. Brooker Mills, in the Chair.

Funic Pulsations—When to Ligate the Cord.—This paper was read by Dr. William Harmar Good. He said that the question was, Are the funic pulsations fetal or maternal in origin? In answer to this question one case was reported where, in a six months' miscarriage, the cord pulsated five minutes after the whole contents of the uterus—child, placenta and membranes intact had been expelled. In another case a ligature was placed around the cord, the pulsation on the placenta side immediately ceased, while those on the fetal side continued for some time. As the pulsations are fetal in origin in a case with a relaxed uterus and a child forcing a lot of blood into a sponge-like placenta, one should not wait for cessation of pulsation before ligating the cord, but, as Caviglia has pointed out, ligate the cord during the first firm contraction of the uterus when the blood is forced out of the placenta into the child.

Dr. A. Bern Hirsh felt that the pulsation originated from the mother, at least to a very large extent. He did not believe that hemostats or ligatures should be applied to the child immediately after birth, but that the cord should be severed before the application of either. He also felt that resuscitation had been aided in many cases by allowing some bleeding.

Dr. Samuel Wolfe felt that as there was no direct communication between the maternal and the fetal circulation, the pulsation must necessarily emanate from the fetus. In reference to tying the cord, he believed that there should be a fair amount of weakening of the funic circulation before it is tied, and if no contractions occur, did not believe tying was necessary. He did not believe bleeding should be permitted, unless there was some indication, such as asphyxiation, therefor.

Dr. Good, in closing, felt that the fact that the pulsations were fetal and not maternal could be demonstrated by observing whether the pulsations were synchronous with the maternal or the fetal heart, and also by the fact that if a hemostat was placed on the cord, the pulsation would cease on the maternal side, but continue on the fetal. He believed that the cord should be ligated in healthy children at once, but that in weak children it is better to wait.

"Syphilitic Pharyngeal Abscess with Necrosis of the Cervical Vertebrae."—Dr. Nathan G. Ward, of Philadelphia, called attention to the fact that syphilis of the upper respiratory tract might occur during any of the three clinical stages of the disease, and may be merely inflammatory, with or without ulceration, or there may be excessive necrosis, the most distinctive and intractable lesions occurring in the tertiary stages, and postpharyngeal abscesses with necrosis of the cervical vertebrae being rare. He reviewed the work of Allin, who in 58 cases of postpharyngeal abscess, four of which were complicated by cervical necrosis of syphilitic origin, and also the cases reported by Mackenzie and Chapman. He then reported a case which occurred about three weeks after the last confinement which occurred about twelve years ago; the first manifestations

of the disease appearing on the genitalia, followed six weeks later by erythematous, papular and vesicular eruption over the entire body, later disappearing, after which she was free from trouble for some time, when ulcerations appeared on the anterior surfaces of both legs below the knee; one over the left malar bone, and a severe iritis with synechia. When first seen by the writer, September 25, 1898, these lesions had all healed but there were three ulcers on the right shoulder and one on the posterior wall of the pharynx about three-quarters of an inch in diameter surrounded by soft pulpy granulations and covered with yellow, foul smelling pus, which continually oozed from the sinus at the bottom of the ulcer. A probe passed down the sinus to the cervical vertebrae showed it to be hard and resistant, with no rough or necrosed areas. She had been unable to lie down for six months, and the pain was so intense that very little sleep was obtained in a Morris chair, which was worse at night and in damp, stormy weather, it being necessary whenever she moved to steady her head with both hands. The ulcer was cleansed daily with peroxide of hydrogen and the granulations touched twice a week with chromic acid. Her history revealing the fact that iodides and mercury had already been given to the point of tolerance, the following was given in teaspoonful doses three times a day:

R	Iodide	
	Bromine, aa.....	gr. $\frac{3}{4}$
	Phosphorus	gr. $\frac{1}{100}$
	Sherry, q.s.....	dram 1

In addition, phosphate of sodium and calomel were given to prevent constipation. K. I. was attempted to be administered without the patient's knowledge, but each time she detected its presence and complained of pain and nausea. In about three weeks the ulcer looked healthier and soon after broke down and was as bad as at the beginning. About the middle of November a small piece of bone was seen protruding in the sinus, which could be manipulated slightly, but was not entirely free, and moving it caused much pain. By gently moving it at each visit, in one month it was entirely free and a piece of bone one inch by three-quarters of an inch was removed, which was full of holes. Again the ulcer underwent a course of healing and growing worse and in March of that year another piece of bone was removed one-half inch square, after which the ulcer healed and has remained so during the period of four years following it, and there have been no symptoms.

Dr. Carle Lee Felt stated that he believed a long time was required to completely eradicate the syphilitic poison from the system, and that many of the cases recurred in some form after being pronounced cured, reporting a case which had been discharged as cured followed a month later by syphilitic gumma obstructing the nose. He reported another case in which the patient was suffering from a thickened nasal wall, and although he absolutely denied specific infection, the condition was cured by the use of K. I. In reference to the Wine of Iodide, he stated that he employed it with benefit in a case in which K. I. could not be tolerated.

Dr. Lewis S. Somers felt that syphilis was one of the most complicated diseases involving the walls of the pharynx, the posterior wall being usually affected. He believed that no matter what treatment was used, the disease was liable to reappear for three or four years, and referred to the case of a man where there were local manifestations twenty-five years after the discontinuance of treatment.

Dr. J. Cardean Cooper felt that Wine of Iodide was

especially valuable because it improved the patients' general condition, as the stomach is frequently in a condition where it will not tolerate either food or medicine. He remarked the fact that women usually improve more rapidly than men, which he attributed to the fact that they did not smoke, as the improvement was also more marked in men who were non-smokers. He did not believe that syphilis was an incurable disease, and felt that in those cases which were reported as showing no manifestations for twenty-five years, the symptoms had been present, but were so slight that they had been overlooked.

Dr. Ward, in closing, stated that he had seen two cases of gumma of the posterior wall of the pharynx, and called for the necessity of promptly arresting the progress of the disease in order to prevent the destruction of tissues. He stated that he had received marked good by inhalation of tincture of iodine in the form of a vapor, using the water as hot as it can be borne.

MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND.

SECTION ON CLINICAL MEDICINE AND SURGERY.

Stated Meeting, held Friday, October 16, 1903.

Election of Officers.—John B. Blake, M.D., was elected President; Dr. Macgruder, Secretary, and Dr. Ruhrhah, junior, member of the Executive Committee for the ensuing year.

Sarcoma of the Nasal Septum. Exhibition of Case and Pathological Specimen.—Dr. R. H. Johnston presented this subject. The patient is a woman aged 70 years. Her mother died at 78 years of an abdominal tumor which was diagnosed a cyst and had originated two years previously. One sister died from a growth in the left side of the neck. The patient has lived an active life as a nurse since 1861. Her health has been good since childhood until two years ago, when she had an attack of pneumonia. In December, while nursing, she contracted a "cold in the head." Home remedies were applied without effect and in February a swelling appeared on the left shoulder followed by involvement of the pre-auricular glands. At this time her physician found a nasal obstruction, but the glands were diagnosed as tuberculous. Three weeks ago the patient came to the Presbyterian Hospital of this city. The left side of the nose was swollen, the pre-auricular and cervical glands were enlarged as well as those above the clavicle. The patient complained of complete nasal obstruction and asthmatic attacks, but there was no pain or hemorrhage. Examination showed a deviation of the septum on the right side with complete obstruction of the nasal passage. On the left side there was a pink, hard, non-movable swelling which was attached to the septum, bled easily and closed the nasal passage. Under the microscope the section of the tumor showed that it was largely cellular with little connective tissue and the diagnosis of sarcoma was made. The tumor was inoperable but portions of it were removed in order to increase the patient's breathing space. The opening, however, closed as fast as it was made. The glands are continually growing and are becoming tender. Dyspnea and dysphagia are now present and enlarged glands are palpable in the axilla. Sarcomata of the nose are rare, Kümmel being able to collect only 69 cases in the literature. The inguinal glands in this case are not enlarged, but the patient complains of some abdominal tightness pointing possibly to involvement of the liver. The question was raised whether this case had any connection with Hodgkin's disease. Microscopically the

tumor is a lymphosarcoma, and it is important to know whether the symptoms of nasal obstruction or the glandular enlargement appeared first. Dr. Johnston stated that the patient is certain the nasal obstruction appeared before the glands.

Creeping Eruption.—Dr. Hamburger said that this disease was unrecorded in America until September, 1902. Patient was an imbecile boy of four years. His history could not be obtained. Examination showed a linear eruption about the center of the buttock running vertically and about $1\frac{1}{2}$ mm. wide. It was pale red, raised and surmounted above by vesicles. The lower portion consisted of purplish brown pigmentation surrounded with crusts. The lesion was migrating slowly, the line advancing about 6 cm. in twenty-four hours. A piece of skin just ahead of the growing end was excised; no parasite was found, but the line immediately faded and has since disappeared. Dr. Lee, of London, showed a case of creeping eruption before the clinical society there in a child three years old. The line migrated $4\frac{1}{2}$ inches in twenty-four hours, taking a very irregular course from the leg across the back and abdomen. It was cured by excision. Crocker calls this disease larva migrans. Several cases of creeping eruption have been observed in Russia, where the disease appears most frequently in the autumn months and shows a black point just ahead of the growth which has been proven to be a larva, similar to that of the fly. None but the Russian cases have shown larvæ, although the symptoms of cases observed elsewhere point to a closely allied, if not identical, etiology. The disease is prone to affect children and involves generally the uncovered portions of the body, but often the buttock. In Russia the peasants seem to be most often affected. The characteristics are those of an advancing red line with a pigmented area left behind. Vesicles are frequent but pustules never occur. The duration varies from a few days to five weeks. In one of Crocker's cases it lasted $2\frac{1}{2}$ years. The serpiginous course and the absence of suppuration show the diagnosis. The treatment is obvious: Excision of the piece of skin just ahead of the advancing lesion. The larvæ of the bot fly are parasitic to mammals, but the parasitism is limited to one species. Myiasis, or infection with the larvæ of flesh flies, is generally divided into two forms, the internal and external. The intestines, nose, eyes, urethra and vagina may be affected by the disease. In external myiasis the bot flies probably play a part and the larvæ of creeping eruptions belong probably to the bot fly group. The symptoms of cutaneous myiasis seem to vary in different geographical regions. The points of interest in Dr. Hamburger's case are (1) the dermatological features; (2) the question of its relation to myiasis; (3) the fact that it is only the second case described in this country. Dr. Lord also had a case of creeping eruption in his clinic in a Bohemian woman, forty-five years old. The disease lasted four to five weeks. No larva could be found, and it was cured by excision.

The Bicêtre Hospital of Paris.—Dr. Emerson discoursed on this subject. The Bicêtre Hospital is an insane asylum and almshouse for men as the Salprière is for women. It has a beautiful situation and an interesting history. It was founded in the thirteenth century by the Bishop of Winchester as a settlement on his estate. In 1657 Louis XIV. established an asylum and almshouse for retired soldiers, luetics, children of dissolute parents and other unfortunates and the hospital has since had great historical interest. The first school for imbeciles was established here and Pinel introduced humanitarian treatment at this hospital, and not at the Salprière, as is commonly supposed. Broca

also had his training there. The hospital has about 3,500 inmates, gathered from the poor, the insane and the idiotic children of Paris. The city spends on it about \$400,000 a year. The treatment is good and the poor of Paris desire to be admitted to the hospital. There is a splendid insane department, a fine school for idiotic children under Borneville, and the wealth of material for neurological students is tremendous. Marie has charge of these cases and their number and value may be judged from a few statistics. The first case of ascending peripheral neuritis, now called syringomyelia, was reported from this clinic; so, of the first case of double athetosis, now known to be chronic chorea. Here, too, are the original cases of cerebellar ataxia and syringomyelia of the ataxic type. Marie, while studying hemiplegia from the standpoint of the palatal reflex, collected 50 right-handed cases and 50 left-handed cases and in another investigation gathered together 20 cases of syringomyelia, a disease considered a rarity elsewhere. The abundance of material may be further estimated from the fact that one autopsy is made a day and only the nervous system of the subject is examined. Marie actually finds more cases of combined sclerosis than he can follow. Paris affords a splendid chance for one who knows just what he wants and needs material for study.

THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.*

The President, Dr. Samuel J. Meltzer, in the Chair.

THE third regular meeting of the Society for Experimental Biology and Medicine was held in the lecture room of the Department of Zoology, in Schermerhorn Hall at Columbia University, on Wednesday evening, October 21.

The following reports† and demonstrations of original investigations were made:

An Experimental Study of Cell Specification in Embryonic Development.—Prof. Edmund B. Wilson presented the results of a study of the development of isolated embryonic cells, in the mollusks *Patella* and *Dentalium*, which demonstrates that from the first cleavage onward an isolated blastomere undergoes essentially the same differentiation as if it had remained in connection with its fellows. These eggs accordingly show a true mosaic-development, and differ widely in this respect from those of echinoderms. It was also shown that the specific character of the cleavage-cells is predetermined, at least in part, by specification of the regions of the unsegmented egg from which the blastomeres arise, as is proved by the development of fragments obtained by cutting the egg in two before development has begun.

The Occasional Presence in the Blood of Untreated Adult Animals of Large Amounts of Substances Agglutinating Many Bacteria, With Demonstrations.—Dr. William H. Park said that the affinities of bacteria for specific agglutinins have, since the researches of Gruber, been made use of to establish relationship between different cultures. The test properly performed is delicate and reliable, but when carried out with insufficient precautions is often misleading. It has been known for some time that the blood of animals before immunization possessed, in moderate amount, substances which agglutinated many bacteria. An agglutination of bacteria must, therefore, take place

*From American Medicine.

†The abstracts here given have been prepared by the authors themselves. The Secretary has made only a few abbreviations and minor changes.

in a high dilution of serum before it can be considered a specific reaction. From results obtained in his own researches Dr. Park considers that even this requirement is insufficient. He found that before any inoculations had been made the blood serum of certain horses agglutinated, even in such great dilutions as 1 in 1,000, both the bacilli having the characteristics of the true dysentery bacilli of Shiga and those having the characteristics of the mannate-fermenting class of Kruse, Flexner, and Duval. This was true to a somewhat less extent of the serum of full-grown goats. It has happened in some instances that after repeated injections with cultures of one of the varieties of the dysentery bacilli, the animal's blood agglutinated the variety of bacilli not used in immunization in as great or even greater dilutions than it did the variety injected.

It was found that a serum drawn from a horse which had been immunized by repeated injections of the dysentery bacillus received from Shiga, agglutinated this bacillus in dilutions of 1 in 500. The same serum, however, agglutinated the mannate-fermenting bacillus in dilutions of 1 in 1,000. The serum from another horse which had received injections of the mannate-fermenting bacillus, agglutinated this bacillus in dilutions of 1 in 1,000, but also agglutinated the Shiga bacillus in dilutions of 1 in 500. Judged by these reactions, these two varieties of bacilli would appear to be much alike in their affinities. Indeed, Shiga and Flexner seem to have come to this mistaken conclusion. Duval and Bassett certainly fell into this error when they announced, in the fall of 1902, that the mannate-fermenting type from the Baltimore diarrhea cases, and the Shiga type, had identical agglutination characteristics.

The blood of young animals was found by Dr. Park to be comparatively free from bacterial agglutinins. A goat six weeks old was found to possess no appreciable bacteria agglutinating substance in its blood. After four injections of a culture of Shiga dysentery bacilli, its blood in dilutions of 1 in 500 agglutinated Shiga bacilli, but only in dilutions of 1 in 20 the mannate-fermenting variety. A rabbit whose blood was negative before immunization, after six injections of this bacillus agglutinated the mannate-fermenting bacillus in dilutions down to 1 in 5,000. The Shiga bacillus was agglutinated only in dilutions of 1 in 20. The slight development of substances which agglutinated the mannate-fermenting type during the process of immunizing to the Shiga bacillus cannot be considered as showing any affinity between the Shiga type, and the fermenting type, since about the same increase was found in animals injected with nutrient bouillon and other substances.

Gastric Secretion Induced by a Reflex From the Intestine.—The main points in Dr. Holmes C. Jackson's results were summarized by him as follows: (1) The introduction of alcohol into the intestine sets up a reflex which causes the secretion of gastric juice. (2) Section of the nerves which supply the stomach (vagi and sympathetic), or the administration of atropine, prevents this reflex, whereas nicotine has no such effect. (3) Of the substances other than alcohol examined in this connection, it was found that oil of peppermint also induces a reflex secretion, but that other irritants, such as mustard and ether, do not show this action. (4) Section of the nerves, or the administration of atropine or nicotine, followed by the introduction of alcohol directly into the stomach, gave results similar to those obtained when the alcohol was injected into the intestine.

The Organism of Smallpox, With Demonstrations.—Dr. Gary N. Calkins, after briefly describing some of the phases in the complicated life history of the smallpox organism, *Cytoryctes variolæ Guarnieri*, demon-

strated twelve stages of the organism stained by an adaptation of the Borrel method whereby the organism stains red upon the green background of cell body and nucleus. A similar parasite, as yet undescribed, in the macronucleus of *Paramaecium caudatum* was also shown.

On Respiratory Stimulants, With Demonstration.

—Dr. George B. Wallace demonstrated a method for estimating the volume of expired air. A rabbit was used and the volume of air expired under normal conditions, and after the animal had been given a respiratory stimulant, was measured. The apparatus used was a modification of the one devised by Dreser. In the experiments reported by Dr. Wallace, the greatest increase in respiration occurred after administration of atropine, the amount of expired air being increased 75 per cent. Strichnine produced an increase of 35 per cent., caffeine, 9 per cent.; cocaine, 7 per cent.; aspidospermine and quebrachine (two alkaloids obtained from *Quercho blanco*), 9 per cent., and 17 per cent., respectively.

The Intracellular Reduction of Gold Chloride, With Demonstration.—Dr. A. N. Richards' experiments were on the effects of intravascular injections of the double chloride of gold and sodium, and were carried out under the direction of Professor Schmiedeberg. Microscopic examination of the tissues of rabbits killed by lethal doses of this salt shows the deposition of metallic gold in and immediately about the nuclei of the cells of the kidney, liver, spleen, mucosa of the gastrointestinal tract, and cardiac muscle. By chemical analysis, it was found that by far the greatest amounts of gold are deposited in the kidney and liver, only traces having been recovered from the other organs.

On account of the ease of reduction of this salt and the possibility of the accurate estimation of the metallic gold, its use is recommended as an indicator of the quantitative relationship of the reducing processes in the various organs.

Effect of Ligation Upon the Vital Staining of Nerves, With Demonstration.—The President, Dr. Samuel J. Meltzer, demonstrated pieces of dried sciatic nerves of rabbits which *intra vitam* received intravenous infusions of methylene blue. Single ligatures of the nerve, no matter where applied, are without any influence upon the color of the nerve on either side of the ligature. When the nerve is ligated at two places, the section between the two ligatures remains free of color, while the central and peripheral ends of the nerve turn blue in the usual manner. The effect is the same even if the ligatures are applied near either end of the nerve. This fact shows that, in the vital staining, the methylene blue reaches the nerve only from its central and peripheral ends.

Effects of Blood-letting on Metabolism.—The Secretary, Dr. William J. Gies, reported the results of some experiments recently conducted by him in collaboration with Dr. P. B. Hawk. The experiments were carried out on dogs in a state of nitrogenous equilibrium. The withdrawals of blood were made while the animals were under the influence of ether-chloroform. The metabolic effects of anesthesia and of operation were carefully controlled. We found that hemorrhages of about three per cent. of the body-weight caused among other effects, (1) diminished secretion, and decreased specific gravity of the urine at first, the reverse in twenty-four to forty-eight hours afterward; (2) increased elimination of nitrogen and sulphur, and decreased excretion of phosphorus, in the urine. The amount and consistency of the feces were unaffected. Repeated hemorrhages from the same animal resulted in (a) cumulative quantitative metabolic effects in harmony with those indicated above, and were followed by (b) steady decline in body weight and (c) gradual increase in average daily

volume of urine, even when the animals ate the same amount and kind of food, as at the beginning.

After successive hemorrhages at intervals of a few days the content of nitrogen, sulphur and phosphorus in the blood, as well as specific gravity and number of red corpuscles, gradually diminished, whereas the leucocytes steadily increased in number. Their data confirm the general metabolic results obtained in the earlier experiments by Bauer and others, and disagree with the opposite conclusions, as to effect on protein catabolism, announced two years ago by Ascoli and Draghi.

BOOK REVIEWS.

SYPHILIS IN DENTISTRY. By L. BLAKE BALDWIN, Chicago, Professor of Dermatology and Venereal Diseases, Post-Graduate Medical School, and EZRA READ LARNE, M.D., Chicago. E. H. Colegrove, Chicago.

THIS little book of but 120 pages furnishes in brief very useful information as to the possibilities of the contraction of syphilis innocently, and contains valuable information not only for dentists, but for medical men. A good historical account forms the introduction and the work is illustrated by a series of colored plates, sure to form an attractive feature for dentists, since they are not likely to be familiar with the appearance of syphilitic lesions. There is a short but valuable appendix on the medicolegal aspects of syphilis that adds another commendable feature to the volume.

YEAR-BOOK OF THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK, June, 1903.

THIS little book in its 200 pages forms an excellent index of the work that is being accomplished by the youngest of our local medical societies here in New York. The officers and executive committee of the society, Medical Association of the Greater City of New York, certainly deserve to feel proud of having found a place for a medical society and then having filled that place so well. The scientific proceedings as given in brief, form an excellent compendium of the year's work and we commend it to other societies as an example of one way to secure a valuable reminder of the subjects that have been discussed.

THE PRACTICAL MEDICINE SERIES OF YEAR BOOKS. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Issued Monthly Under the General Editorial Charge of GUSTAVUS P. HEAD, M.D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School. Vol. VII. Pediatrics, Edited by ISAAC A. ABT, M.D. Orthopedic Surgery, Edited by JOHN RIDLON, A.M., M.D., June, 1903. The Year Book Publishers, Chicago.

THESE handy little volumes are making a distinct place for themselves. The review of the literature is excellent and well calculated to keep the general practitioner in touch with medical progress. Advances in medicine are often a source of surprise. Aphthous stomatitis, for instance, has always been in the minds of most practitioners a simple form of infectious disease of the mucous membrane. The review of the literature in the present volume shows its relation to foot and mouth disease. The question of typhoid fever in children is excellently reviewed and shows that this chapter is not, as used to be considered, the analogue of that part of natural history which bears the title, "Snakes in Ireland." Of course, Professor Ridlon's review of orthopedic surgical progress is complete and practical.

GYNECOLOGY. A Text-book for Students and a Guide for Practitioners. By WILLIAM R. PRYOR, M.D., Prof. of Gynecology in the New York Polyclinic Medical School; Attending Gynecologist to the Polyclinic Hospital; Consulting Gynecologist to St. Vincent's Hospital, New York City Hospital, St. Elizabeth's Hospital; 163 illustrations in the text. D. Appleton & Co., New York and London.

IN writing this little manual, the author has tried to avoid all the unnecessary portions of the subject which are not essential for a practical working knowledge of the diseases of women. Special endeavor has been made to have this book valuable as a ready reference to those working in private practice, where time is too often lacking for the reading of the larger and more comprehensive volumes devoted to the subject.

Realizing that the average practitioner is called upon to treat many simple gynecological troubles and that he may be "at sea," most excellent and explicit rules for treatment are to be found in the various chapters devoted to the specially common female complaints.

There is no doubt that the book will serve most satisfactorily the purpose for which it was intended.

DISEASES OF THE EYE. By HENRY R. SWANZEY, A.M., M.B., F.R.C.S.I., Surgeon to the Royal Eye and Ear Hospital and Ophthalmic Surgeon to the Adelaide Hospital, Dublin, etc. Eighth revised edition. With 168 illustrations and zephyr card of Holmgren's tests. P. Blakiston's Son & Co., Philadelphia.

THIS well-known book has been thoroughly revised, and with numerous additions, which bring it well up to date, deserves the approval it has hitherto received. A brief mention of some of the newer features shows that the author is in touch with what is best in modern progress: In Chapter IV, a description of conjunctivitis petrificans; in Chapter VI, a description of grating keratitis, guttate keratitis, etc.; in Chapter VIII, a more detailed account of Kuhnt's method of extirpation of the lacrymal sac; in Chapter X, a more detailed account of sympathetic ophthalmitis. The treatment of this important subject is a model of clearness and conciseness.

Chapter XIV contains an unusually clear description of the use of the Roentgen rays for the discovery of foreign bodies, and of the magnet for their removal.

The portions of the book dealing with the relations of the eye to the nervous system are among the most helpful, in concise form, of the many treatises on this subject within reach of the student.

The conservatism of the author and his admirable style are sufficiently familiar. The book is well indexed. The illustrations are not as numerous as has been the custom in recent works on the eye, and are not especially well executed. This book may be warmly recommended as a practical guide for the student, dealing less with the theory and pathology of the subject than with diagnosis and treatment.

SIGHT AND HEARING IN CHILDREN. By ROBERT BRUNELL CARTER, F.R.C.S., Consulting Ophthalmic Surgeon to St. George's Hospital, and ARTHUR H. CHEATLE, F.R.C.S., Assistant Aural Surgeon to King's College Hospital; Surgeon to the Royal Ear Hospital, etc. pp. VI+120. The Scientific Press, Limited, London.

THE first part of this admirable little book comprising seventy-five pages is devoted to vision, its mechanism, the causes and consequences of its defects, aids to vision, and the cultivation of vision.

It would not be easy to make the complex subject of

optics as well as the physiology of the eye more clear to the laity than is done in the first chapter.

It is, of course, a question whether many teachers and parents will make even this brief excursion into a land unfortunately too little known, but there should be no chance for ignorance, and we know of no book giving information indispensable to those having charge of the education of children so simply, with such charm and absence of pedantry, as does the one under consideration.

Certain points deserve especial consideration. The importance of having the vision of all children examined at the beginning of school life, and at intervals thereafter; this should be done, the author holds, not only as regards acuteness, but also as regards rapidity of perception. The methods employed in the child's instruction, the amount of work exacted from him in a given time, and perhaps his ultimate destination in life, should all be governed by a complete recognition of the nature and degree of his defect.

Although it is the author's intention to put clearly before the public the causes and consequences of defective sight, there are pages which may be read with profit by the specialist, so full are they of conservative common sense. Fortunately, in this country, educators are aware of the importance of testing the sense perceptions of children, and with characteristic zeal the professional part is being done very thoroughly—perhaps too thoroughly the author thinks, in some particulars, at least.

The importance of exercises, preferably competitive, for the cultivation of vision, and the use of charts, such as those suggested by Dr. Joy Jeffries, for the development of color perception (not, of course, with the hope of influencing or altering the defective sense of the congenitally color-blind) is recommended.

In the remaining 40 pages is compressed a very clear and practical description of the ear, nose and its adjacent parts, with suggestions for their care, such as all having to do with children should be made perfectly familiar with. The prevalence of partial deafness among children will no doubt surprise many non-professional readers, and the importance of its prevention should be impressed upon them. The chapters devoted to the care of the ears in childhood, especially as regards the general health and hygienic surroundings, and to the recognition of diseases of the ear and of the nose, are especially to be recommended. No suggestions are made as to treatment, for, as the author wisely says—"Household surgery is always risky unless it is guided by the surgeon's hand, and probably is most dangerous in diseases of the eye and ear."

DISEASES OF THE NOSE AND THROAT. By CHARLES HUNTOON KNIGHT, A.M., M.D., Professor of Laryngology, Cornell University Medical College; Surgeon, Manhattan Eye and Ear Hospital, Throat Department, etc. P. Blakiston's Son & Co., Philadelphia.

A WRITER on this specialty must needs bring medicine and surgery unconsciously into a very close relation, for it is but a short step from spraying the nose to the ablation of hypertrophied tissue in rhinitis, or from the removal of adenoids to the opening of the Eustachian tubes by Politzerization. Many authors are indeed tempted by the technical interest of surgery to magnify the importance of operations and to pay too little attention to non-surgical treatment, a scheme which does not suit the general practitioner who is looking for information which he can apply in his practice. Such a fault can hardly be attributed to the present author, for in his own words "The contents (of this book) have formed the basis of a course of lectures at Cornell Uni-

versity Medical College and are arranged chiefly for the convenience of students." As the student is taught so that he may become a good practitioner, we can think of no arrangement that could better satisfy the physician's needs. The order of subjects is Nose, Pharynx, Tonsils and Larynx. A short chapter on the anatomy and physiology of the parts is followed by one on "Methods of Examination," in which attention is directed to the importance of the much-neglected digital examination of the nasopharynx. The subjects of adenoids and hypertrophied tonsils are most fully treated, the author having no words too strong in condemnation of those who advise to leave children with hypertrophied tonsils to outgrow the condition. The illustrations are good and we commend the book as an excellent working text-book on the subject.

FIRST PRINCIPLES OF OTOTOLOGY. By ALBERT H. BUCK, M.D., Clinical Professor Diseases of the Ear, College of Physicians and Surgeons, Medical Department of Columbia University; Consulting Aural Surgeon New York Eye and Ear Infirmary and Presbyterian Hospital. Second edition. 216 pp. Wm. Wood & Co., New York.

IN this little book the author shows the power so familiar to his many students, of selecting from an immense experience the essentials of his subject. It puts forth in a clear, concise and accurate manner the fundamental principles of otology. The work is not burdened by various theories, confines itself to established facts, and embodies the personal views of its distinguished author. It well represents the advancement of aural surgery of to-day. The purpose for which it was designed, to meet the need of the student and general practitioner as a ready and practical reference, it meets admirably.

DISEASES OF THE EYE. By CHARLES H. MAY, M.D., Chief of Clinic and Instructor in Ophthalmology, College of Phys. and Surg., N. Y., 1890-1903; Ophthalmic Surgeon to the French Hospital, etc. Third edition, revised. With 275 original illustrations, including 16 plates with 36 colored figures. pp. XIII+408. Wm. Wood & Co., New York.

THE popularity of this book is attested by the rapid succession of editions, and it is a well-deserved success. The author has learned by thirteen years of experience in teaching, what the medical student should know, and what, in the multiplicity of his immediately important duties, may be omitted. The descriptions are terse and clear, and no space is wasted with details of theory or discussion of mooted points.

The appearance of the volume and the excellence of the illustrations, an unusual feature in books of this caliber, are worthy of note.

BOOKS RECEIVED.

The MEDICAL NEWS acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the MEDICAL NEWS will shortly appear.

LABORATORY GUIDE IN URINARY ANALYSES IN TOXICOLOGY. By R. A. Withaus. Fifth edition. 115 pages. Illustrated. Wm. Wood & Co., New York.

A TEXT-BOOK OF DISEASES OF WOMEN. By Dr. B. C. Hirst. 8vo, 675 pages. Illustrated. W. B. Saunders & Co., Philadelphia, New York and London.

A TEXT-BOOK OF OPERATIVE SURGERY. By W. S. Bichman. 8vo, 984 pages. Illustrated. W. B. Saunders & Co., Philadelphia, New York and London.